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General Heading: **BAKER GUIDING, FLOATING, CEMENTING EQUIPMENT**

Unit No. **A-15**

Subject: **How To Do That Shoe Job Successfully The *First Time***

BAKER OIL TOOLS, INC.

Main Office and Factory:
6000 So. Boyle Ave., Box 127, Vernon Station, Los Angeles, Calif.
Central Division Office and Factory:
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Export Sales Office:
19 Rector Street, New York, N. Y.

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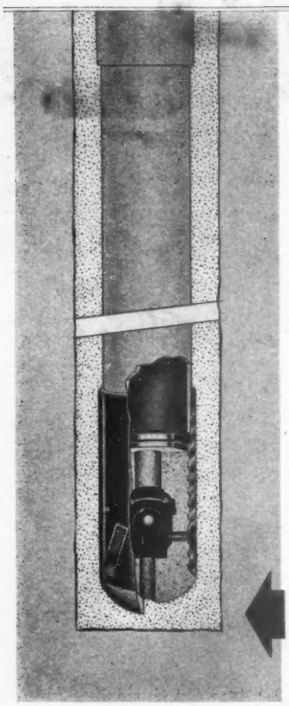


DO THAT SHOE JOB THE *FIRST TIME* WITH A . . .

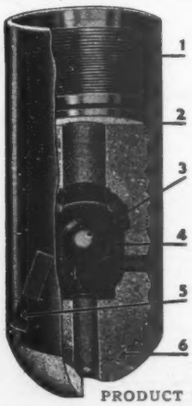
Under today's conditions, the securing of a successful first-time cement job is more than just "important" . . . *it is vital!* We can't afford to lose the additional man hours, rig time and materials required for a "second-time" job. They are needed to drill and cement a second well—not for second-time use on the same well.

Baker's contribution to this war-time problem, is making available cementing devices which afford every possible opportunity for securing successful results the *first time.*

An outstanding example of such a device is the *Baker Cement Wash-Down Whirler Float Shoe (usually used in combination with a Baker Cement Float Collar). This Shoe not only assures safe and proper landing of the casing, but through its efficient "whirler action" provides best possible chance for complete encasement of the pipe with a uniform body of cement, with the hazard of channeling reduced to a minimum. In addition, when the cement job is completed, the internal construction of the Baker Cement Wash-Down Whirler Float Shoe can quickly and easily be drilled out leaving no harmful fragments in the hole to interfere with further deepening operations.

For complete details concerning the Baker Cement Wash-Down Whirler Float Shoe and other efficient Baker Guiding, Floating and Cementing units, see pages 227-241 of the 1942 Baker or Composite Catalog.

★ BAKER CEMENT WASH-DOWN WHIRLER FLOAT SHOE



PRODUCT NO. 120—
Baker Cement Wash-Down Whirler *Float Shoe. (*The Baker Wash-Down Whirler principle is also available in a Guide Shoe)

IMPORTANT FEATURES:

(1) THREADED CONNECTION FURNISHED TO FIT ANY TYPE CASING. Baker Floating Units can be furnished with threaded connection to fit the specifications of your casing. (Float collars can be furnished with both "double female" and "male and female" threaded connections.) Manufacturing precision assures thread uniformity and accuracy.

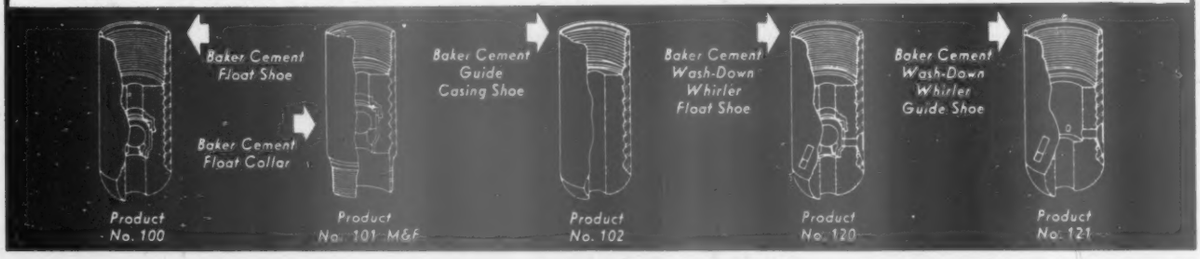
(2) STRENGTH. The seamless steel casing shoe into which the concrete plug and Plastic BALL-TYPE Valve Assembly are securely anchored, provides a unit that has the **STRENGTH** to float the longest and heaviest string of casing with an ample factor of **SAFETY.**

(3) POSITIVE, LEAK-PROOF BACK-PRESSURE VALVE. The buoyant Plastic BALL-TYPE Back-Pressure Valve floats in the cement slurry or rotary mud and instantly forms a leak-proof double seal against a narrow, tough rubber ring (backed by Plastic and concrete) at the slightest reversal of pressure. Here Is Valve Efficiency at its best.

(4) AMPLE CIRCULATION AREAS. The correctly designed, streamlined Valve Assembly provides passageways ample for any circulating or cementing operation . . . a fact attested to by actual field performance under the most severe operating conditions.

(5) BAFFLED WHIRLER PORTS provide wash-down whirler action so important in washing away bridges, preparing formation to receive the slurry, and securing uniform cement distribution. Here is the ultimate in Cementing Efficiency.

(6) EASY DRILLABILITY results from the internal construction of Baker Formula Concrete and Plastic . . . the Plastic **BALL-TYPE Valve Assembly being set** on end in the concrete plug to present a minimum cross-sectional area to the drilling bit. The concrete and the Plastic are quickly drilled up and circulated out of the hole.


Baker Cement Float Shoe
Baker Cement Float Collar
Product No. 100
Product No. 101 M&F
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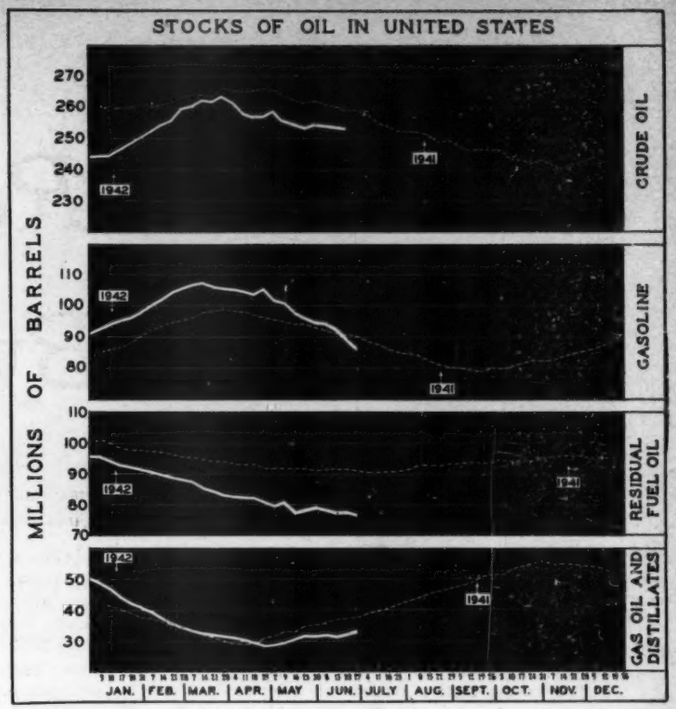
Trends

Price Adjustments Reflect Increased Shipping Charges



FURTHER indications of the greatly increased costs of petroleum operations to refiners, transporters, and distributors, due to war developments, were brought home Monday when price increases authorized by OPA became effective in 17 eastern states and the District of Columbia. The increases were 2½ cents per gallon on gasoline and 2 cents per gallon on kerosene, range oil, tractor fuel, diesel oil, and gas oil. These increases will add more than $125,000,000 to the petroleum bills of consumers in the affected area over the balance of the year.

CRUDE PRODUCTION *3,743,190 bbl. daily average — up 130 bbl. One year ago 3,860,270 bbl.*

CRUDE STOCKS *252,748,000 bbl. as of June 20—down 638,000 bbl. One year ago 259,142,000 bbl.*

GASOLINE STOCKS *88,611,000 bbl. as of June 27 — down 1,236,000 bbl. One year ago 90,414,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *77,304,000 bbl. as of June 27—down 1,183,000 bbl. One year ago 91,296,000 bbl.*

GAS OIL AND DISTILLATES *32,851,000 bbl. as of June 27—up 647,000 bbl. One year ago 37,832,000 bbl.*

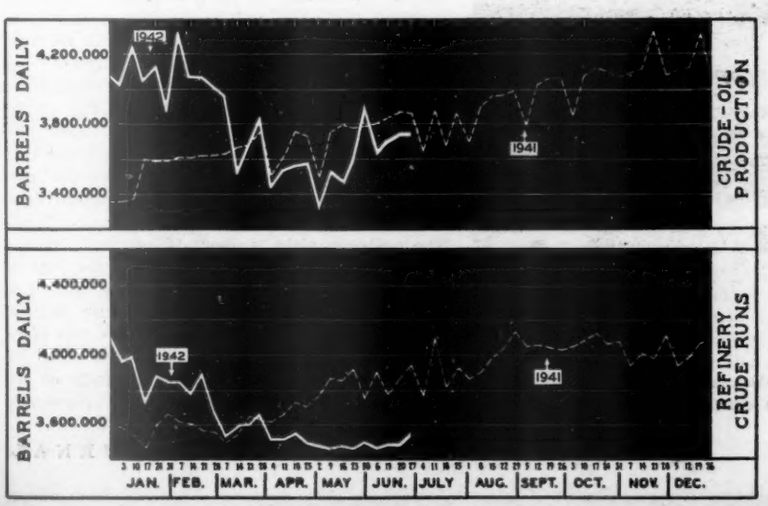
REFINERY RUNS *3,581,000 bbl. daily week ended June 27 — up 147,000 bbl. One year ago 3,949,000 bbl.*

The domestic consumption of gasoline in the 17 states and the District of Columbia the last half of 1941 totaled approximately 120 million barrels. Assuming a 40 per cent reduction in this consumption under the rationing program, the demand over the last 6 months of this year will be 72 million barrels. The 2½ cents per gallon increase will add $75,000,000 to the price received for the gasoline consumed in domestic channels. The deliveries of the four grades of distillates in the same area over the next 6 months will be in the order of 38 million barrels with deliveries of kerosene and range oils totaling approximately 20 million barrels. The 2-cents-per-gallon, or 84-cents-per-barrel, increase in the price of these oils will add another $50,000,000 to the petroleum bill.

These increases in prices are designed entirely to offset the increased transportation charges in the movement of crude oil and products to the eastern area. Included is a deficit of more than $40,000,000 in the transportation pool in the eastern states that has accrued largely because of the substitution of tank cars for tanker shipments in supplying the eastern and southeastern states with petroleum. The increases of 1.2 cents per gallon in the case of gasoline, 0.4 cents per gallon for kerosene, 0.6 cents per gallon for distillates and 45 cents per barrel for residual fuel, which had previously been granted, failed to offset the additional transportation charges the first half of this year. These data show that the increased costs to petroleum consumers in the eastern area will be in excess of a quarter-billion dollars this year. Reports indicate that the latest price increases do not mean that the last has been heard of the complicated eastern oil situation. Complaints have already been filed at Washington by those who are disappointed because residual fuel oils were not included in the price adjustments.

DAILY AVERAGE PRODUCTION FOR WEEK

	June 27, 1942 crude oil	June OPC recommended production all oils	June 20, 1942 crude oil
Arkansas	73,700	75,300	73,810
California	642,250	691,900	672,250
Colorado	6,700	7,600	7,100
Eastern fields	97,925	106,800	98,400
Illinois	277,040	320,800	279,735
Indiana	20,325	18,900	20,550
Kansas	272,100	281,900	279,850
Louisiana	310,700	311,300	307,855
North Louisiana	*90,700*	.....	*88,355*
Louisiana Gulf Coast	*220,000*	.....	*219,500*
Michigan	65,700	63,100	65,200
Mississippi	83,500	49,200	79,865
Montana	23,160	23,400	22,555
Nebraska	3,775	4,100	3,750
New Mexico	80,480	80,600	80,500
Oklahoma	389,300	436,600	377,600
Texas	1,324,300	1,068,600	1,280,700
East Texas	*295,000*	.....	*362,750*
West Texas	*234,450*	.....	*204,850*
North Central Texas	*149,400*	.....	*144,000*
East Central Texas	*94,050*	.....	*93,950*
Texas Panhandle	*107,000*	.....	*88,400*
Texas Gulf Coast	*378,850*	.....	*326,550*
Southwest Texas	*65,550*	.....	*60,200*
Wyoming	92,235	96,200	93,340
Total United States	3,743,190	3,636,300	3,743,060
Total production, Jan. 1-June 27, 1942			676,476,495 bbl.
Same period last year			652,918,620 bbl.



California Refiners Cushion Cost Rise By Consolidation

By L. P. STOCKMAN

LOS ANGELES, Calif.—Independent California refiners, faced with the necessity of effecting substantial reductions in operating expenses because of consistently diminishing sales of gasoline and the small differential existing between crude and refined-oil prices, have launched a retrenchment program. All of the less efficient refineries were closed down over a year ago. A few that operated on "hot" oil or crude bought below market prices are idle or have been junked.

The service-station outlets of independent refiners have been drastically reduced by the wholesale closure of those that could not be operated on lower gallonage and without accessory business. Out of a total of about 15,000 service stations in California, it is estimated that 1,500, or approximately 10 per cent have been closed. Indications are that additional stations will be closed. Some observers estimate that a total of 5,000 stations will be eliminated within the 12 months either through the suspension of business or dismantling of equipment. The only thing that can prevent the premature abandonment of present service stations is a general reduction in site rentals and there does not appear to be much headway in that effort.

Refiners Combat Conditions

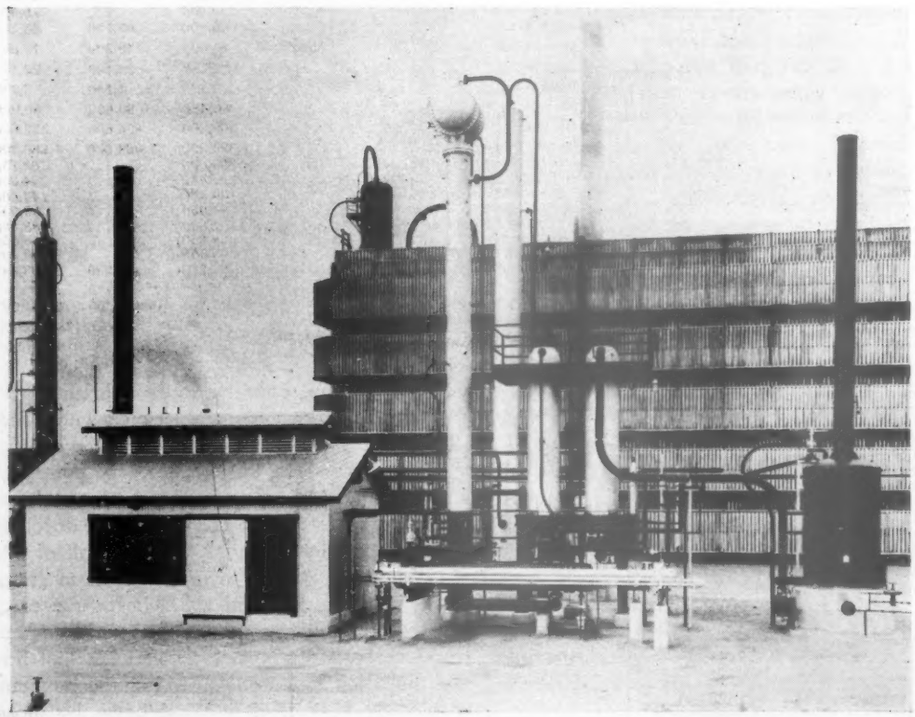
The present emergency is being met by independent refiners and marketers in two ways, but the results differ widely. The principal objective of marketers is to maintain their normal volume and outlets as far as possible. In order to offset conditions all overhead has been cut sharply.

St. Helens Petroleum Co., refining and marketing subsidiary of Kern Oil Co., Ltd., shut down its Pico refinery over a year ago and since then has been delivering its crude production to the Rothschild Refining Co. at Santa Fe Springs and receiving back gasoline made according to specifications. This gasoline is sold under the St. Helens trade name and the company is enabled to keep its normal outlets. This arrangement permits the company to continue operating in the refined-oil market and enables it to resume operation of its plant at a later date if justified by developments. This company, having its own production at Montebello, Midway-Sunset and other areas, is disposing of all current crude-oil production at posted prices. In addition to its operating agreement with St. Helens Petroleum Co., Rothschild Refining Co. is also processing crude oil for another shut-down refiner.

Douglas Oil & Refining Co., which completed a 10,000-bbl. refinery with a Dubbs two-coil selective cracking unit about midway between Los Angeles and Wilmington in 1941, is processing, in addition to its own oil, the crude of Operators Oil & Refining Co., Olympic Refining Co., Elm Oil & Refining Co., Krieger Oil Co., Sunset Oil Co., McCallen Refining Co. and Eagle Oil & Refining Co., Inc. This consolidation of operations has resulted in decreased refining costs and permits continuous operation of the Douglas Wilmington refinery.

Each refiner pays a pro rata share of operating costs and takes delivery of specified gasoline at a price depending upon the quality and quantity. The resulting fuel oil, diesel and gas oil are sometimes taken in kind and sometimes sold to some other marketing company at from 65 to 75 cents per barrel. The accounting problem becomes quite complicated as there are many variations and provisions in each contract as well as in actual operation. As a rule, Douglas reports and pays the state motor-fuel tax as this simplifies the procedure and at the same time protects the operating interest as the law requires the manufacturer to pay the gasoline levy.

The Douglas refinery is admirably suited both as to equipment and location to handle the joint operations of the group. The arrangement has been mutally advantageous to all concerned especially because Douglas, through an agreement with Sunset Oil Co., is able to use the latter company's tankage and pipe-line facilities from Los Angeles Basin fields. By swapping crudes, this consolidated unit is able to eliminate entirely or radically reduce pipe-line hauls, and practically all companies in the unit have one or more exchange accounts. Usually the exchange is effected on a cash basis and in this way each refiner pays for the particular type of crude selected. All samples of crude and refined oil are cross checked, tested and distillation analyses made and harmonized.



One of the catalytic polymerization units in California which is now being converted to the production of components for 100-octane aviation gasoline

Crude Losses Shared

Crude losses sustained in refining are spread among the operators. Charges are made on a current per-barrel basis and each account is balanced monthly. The operators, Sunset, McCallen, Olympic, Elm and Krieger refineries are not equipped with normal cracking facilities and for this reason the present arrangement affords all the advantages of advanced technique without capital cost.

The Eagle company's plant at Santa Fe Springs has cracking facilities but this plant is being revamped for the production of aviation gasoline and for this reason it will not be available for normal operations. In the production of aviation gasoline, the plant will make some motor fuel, but this supply will require augmentation through the cooperative arrangement with Douglas.

The Douglas cracking unit is designed to process approximately 9,000 bbl. per day of 17-gravity reduced crude yielding about 3,300 bbl. of 400-end point, 10-lb. R.v.p. gasoline, residuum approximating Bunker B specifications and gas. The distillation unit is designed to charge 9,000 to 10,000 bbl. per day of 25 to 26-gravity crude oil. The designed yield is about 20 per cent 350-end point light gasoline, approximately 7 per cent of 425-end point naphtha, 6 per cent kerosene distillate and about 6,600 bbl. of 17-gravity reduced crude for charging to the cracking unit. The plant is currently operating in excess of its rated capacity. It was recognized that the designed capacity of the plant did not represent its maximum

operating throughput. Builders estimated maximum capacity at 12,000 bbl. per day; it has even exceeded this rate during the past month. Present facilities are so constructed that additional equipment to increase capacity can be installed with a minimum of work but in view of present conditions it is doubtful if priorities would be granted.

Hancock Oil Co., one of California's largest independent integrated operators, has shut down its Long Beach refinery and is liquidating its stocks of crude and refined oil. This company has extensive production in the Long Beach, Wilmington and Huntington Beach fields and in San Joaquin Valley districts. Hancock Oil Co. discovered the Union Avenue field of Kern County south of Bakersfield in February 1941, but has only drilled a few wells in that field since discovery. By shutting down its Long Beach refinery, Hancock Oil Co. expects to increase profits from its producing operations. It is the present intention to liquidate present inventories of crude and refined oil and negotiate a contract with some other refiner whereby it will be able to secure competitive gasoline and thus maintain its marketing position. This will involve an exchange of crude oil for refined products of specified quality. Decision of Hancock Oil Co. to suspend refining operations indicates that the company anticipates tough sledding for the California oil industry during the next few years.

Facilities to Be Converted

The company plans to start production of aviation gasoline and may revamp present facilities in the near future although no definite decision has been reached. Hancock, like other independent marketers, is anxious to keep its market outlets.

Wilshire Oil Co., another large integrated independent, is preparing to start production of aviation gasoline. This company has accumulated sufficient regular motor fuel to last for some time with the addition of natural gasoline and will devote its attention to production of aviation gasoline. Wilshire has a refinery in the Norwalk district of Los Angeles Basin and equipment is already being received to convert this plant into an aviation-gasoline unit.

In the San Joaquin Valley, Mohawk Petroleum Co. was recently loaned $2,500,000 to permit conversion of its Bakersfield refinery to the production of aviation gasoline.

El Tejon Refining Co. may also adapt its facilities to production of aviation gasoline, but to date no priorities have been granted the company for such work.

Gasoline consumption on the Pacific Coast, reflecting slower and less driving, is headed for lower levels. The first indication of decreased demand in California appeared in February when a normal increase of 10 per cent over the previous year dropped to a gain of 2.6 per cent and in March 1942 sales were 0.77 per cent below demand in March 1941. In April gasoline sales were 16 per cent below last year and in May the gallonage was 14 per cent below the same period in 1941. These trends indicate that gasoline demand during the summer season, July, August and September, will show a much larger percentage drop as few people will make long drives as has been customary during previous vacation periods.

Fuel-oil demand in Pacific Coast territory is the one bright spot in the market outlook. Stocks of fuel oil being consistently reduced, independent refiners are able to dispose of their entire production of residuals at ceiling prices. If the demand for fuel oil had declined a few months ago instead of increasing, it is doubtful if there would be even a handful of California independent refiners operating today.

A new component of aviation gasoline, recently accepted by the Army and Navy and available in volume by comparatively minor conversion of existing refining equipment, has high pressure and low boiling point. Storage facilities such as shown here, play a vital role in storing and handling such light ends

This Week...

PRODUCTION.—Drilling spurted temporarily this week. Operators feared more drastic regulation of all forms of equipment, rushed rigs and supplies to approved locations, to offset possible "freezing" order or lapse of P-98. . . . Current completions fewer than half of same time last year. . . . All important producing states adhere closely to OPC July quotas, in new proration schedules. . . .

TRANSPORTATION.—Several projects using reclaimed pipe under way. Companies reluctant to disclose details because certain certificates from Washington are tardy. Gulf-Magnolia line, Panhandle to Ranger, Tex., being removed, pipe directed to East Texas-Helena, Ark., project and elsewhere. . . . Several coastal companies form Bayou Pipe Line Co., will extend Plantation products system from Baton Rouge, La., to Beaumont, Tex. A West Texas line will be dug up, used on Plantation extension, but which one is indefinite. . . . Coordinator Ickes reveals less than 10 per cent of East Coast petroleum receipts are moving by tankers. . . . Barge shipments to be speeded up. . . . Ground survey of War Emergency line under way, general contracts to be let soon. . . . Plantation main-line power doubled, to accommodate new traffic from extension. . . . Emergency oil freight rates extended to October 31. . . . Tank-car shipments register another moderate rise. . . .

PRIORITIES.—Outlook clouded, by uncertainties. . . . One pertinent change appears certain—procurement will be more difficult. . . . Maintenance Requirements Plan being promulgated. Designed particularly for industries consuming large tonnage of critical metals but not as manufacturers. They include oil, mining, utilities, a few others. . . . End use of metals to be examined more critically by priorities division. . . . Minute probe of inventories likely. . . . Oil companies appear to have lost plea for 90-day cushion of maintenance supplies. . . . All manufacturers using more than $5,000 worth of critical metals per quarter being hastened under Production Requirements Plan. Reaction varied. Some praise PRP, others consider it unwieldy, cumbersome, generally objectionable. Opposition of minor intensity, most manufacturers accept it, prepare to operate under its terms. . . .

LEGISLATION.—Hearings start on bill creating War Petroleum Corp., the $500,000,000 government agency, proposed by Senator Connally. Coordinator Ickes first supporting witness, paints benefits he visualizes for industry. Oil men luke-warm, some outspoken in opposition. Desirable features recognized, if properly administered. Chances for maladministration cause tepid support. . . . Office of Price Administration receives less than half requested appropriation, may curb regulatory functions. . . .

REFINING.—Butadiene brought under full priority control. Survey of existing refining facilities indicates potentialities for increasing production without waiting for special plants. Process inefficient by technical standards which may yield to timeliness. . . . California independents consolidate operations in more efficient plants, share costs in proportion to supplies and requirements. . . . Eventual return of surplus civilian products to reservoirs hinted at strongly, in Coordinator Ickes' testimony, before House committee on banking and finance. Means further reduction in refinery netback.

MARKETS.—Advances of 2.5 cents per gallon on gasoline, 2 cents on light fuels authorized in eastern curtailment area, effective June 29. OPA expects rise to liquidate tank-car pool deficit of 40 to 50 million dollars, over a period. . . . Henderson favored government payment of increased war costs, explained it could not be arranged now, yielded to pyramiding losses suffered by East Coast tank-car suppliers. . . . Mayors of East Coast cities demand higher deliveries of fuel oil to their constituents, propose drawing heavier supplies from District 2. . . .

Industry Faces Further Cut In Equipment Distribution

By HENRY D. RALPH

WASHINGTON, D. C. — The probability that the use of material by the oil industry will be drastically curtailed for at least a brief period of time loomed this week as the Office of Petroleum Coordinator and the War Production Board appeared to be unable to reach an agreement on a satisfactory method of materials control.

Priority Order P-98 was scheduled to expire at midnight July 1, and up to a late hour Tuesday no announcement had been made of any plan to take its place. Without this order or some substitute no branch of the oil industry can obtain any new material of any kind, or withdraw material from its own inventory, even for repair of a breakdown.

Reliable sources indicated that P-98 would be extended for another 30 days as a temporary expedient to permit further negotiations between WPB and OPC over the proper method of controlling the use of material by the oil industry.

When P-98 was last extended on May 15, WPB announced that a new system for oil-industry priorities would be promulgated before June 30. While authority rests with WPB, this put on OPC the duty of recommending a new plan, but as far as can be learned nothing has been suggested to date which meets WPB approval.

Most large users of metals must obtain priorities under the Production Requirements Plan beginning July 1, but the oil industry is specifically exempted. WPB is preparing to announce within the next few weeks a Maintenance Requirements Plan to provide maintenance, repair, and operating supplies on a quarterly basis for those industries and small companies not under PRP. Unless OPC succeeds in persuading WPB to set up a separate plan, it is probable that the oil industry will go under this MRP, when put into effect.

Reports from the oil country that a material freezing order will be issued this week appear to be premature, although failure to extend P-98 or replace it would have the same effect. It is known that the Iron and Steel Branch of WPB has served notice on OPC that drastic steps must be taken immediately to reduce the oil industry's inventories and obtain better distribution of materials on hand. This problem has been placed in charge of William F. Huff, formerly OPC director of materials, who is currently attempting to develop a program. A freezing order would not seem to be indicated at the present time because M-68 is itself a freezing order and prohibits inventory withdrawals except as permitted by P-98.

It is likely, however, that WPB may shortly issue an order preventing oil operators from obtaining more materials until their inventories are depleted, or even requiring companies with large inventories to share them with others. If the industry can agree on a plan for exchanging inventories the WPB may use it as the basis for its order, and this will be one of the major problems before the Petroleum Industry War Council next week.

A preliminary meeting of oil operators and supply-house representatives held by Mr. Huff last week failed to reach any agreement on inventory distribution, despite the threat of impending WPB action. There was no agreement on what constitutes a minimum practical inventory, how the industry's inventories might be pooled and redistributed, nor the size of inventories held by big operators.

The present attitude of WPB appears to be that some plan for reducing the idle inventories of the oil industry must be put into effect before operators will have any assurance of obtaining new supplies. All inventories, particularly tubular goods and items composed of large quantities of steel, WPB has hinted, must be reduced to practically nil before the oil industry will receive much consideration of its requests for priorities on new material.

Before any drastic curb is put on oil-industry inventories, it is probable that WPB will require a detailed survey and report of stocks of materials now on hand. OPC recently made a sampling survey of tubular goods, but a detailed inventory report may shortly be required of all operators.

Oil Men Seek Retention of Maintenance-Supply Section

OIL operators throughout the Mid-Continent and Southwest this week were working on details of changes that are imminent in the control of equipment distribution. Efforts were centered on two chief objectives. They are: (1) Retention of blanket authority to use materials for maintenance and repairs and, (2) a cushion of 90 days' requirements in inventory.

Developments in Washington indicated that the industry may be denied both elements for which it is making a stand and for this reason the future control of supplies is uncertain.

Some oil men coping with the equipment situation anticipated that the industry will be forced under the Maintenance Requirements Plan which is being framed to cover large consumers of critical metals who are not manufacturers. The oil industry is the largest single consumer under this category and from a standpoint of size alone, if no other, has the largest stake in these developments. The entire Washington program is aimed at closer control of the end use of critical metals.

Priority clinics have been held at numerous oil-operating centers during the past several days but in practically all instances the discussions have centered around the Production Requirements Plan.

All manufacturers consuming more than $5,000 worth of critical metals per quarter were to have filed application for priority certificates before July 1. Representatives of the War Production Board conducted the meetings to explain the intricacies of PD-25A, the form upon which PRP applications must be filed. Under the PRP, purchasers are required to classify all orders by a numerical system which is established in Priorities Regulation 10. There are 23 main classifications, each covering a specific industry and several are subdivided by the use of decimals. For example, Class 9 covers power, light and heat. Petroleum, under this general classification, is designated as 9.20, the number which purchase orders for critical metals for the oil industry should bear under the PRP. The numbers on purchase orders which show the classification of the consumer are preceded by letter symbols. There are five letter symbols, including U.S.A. (Army), U.S.N. (Navy), LL (lend-lease), FP (other foreign purchasers) and DP (domestic purchasers). Consequently, most purchase orders for oil-industry supplies will, under the PRP regulations, carry the designation DP 9.20, meaning that a domestic purchaser has bought the material involved for use in the petroleum industry. The symbols and classifications are repeated on purchase orders back through the entire manufacturing and raw material supply lines.

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Price of $1.48 Allowed In University Field

WASHINGTON, D. C. — A maximum price of $1.48 per barrel at the well for crude petroleum of 40-gravity and above, produced in the University field, East Baton Rouge Parish, Louisiana, is established in Amendment 20 to Revised Price Schedule 88 (petroleum and petroleum products) issued Monday by Price Administrator Leon Henderson, and effective July 2, 1942.

That is the price already paid for more than 75 per cent of the crude petroleum produced in the field, and the buyer of the remaining product had notified OPA of its willingness to pay that maximum price and absorb an increase of 2 cents per barrel above the price it is paying currently.

On October 1, 1941, (base date considered in establishing maximum prices for petroleum and petroleum products) Sun Oil Co. was buying more than 75 per cent of the field's production at $1.48 per barrel for the 40° and above crude petroleum, with customary differentials for lower-gravity crudes. At the same time Standard Oil Co. of Louisiana was purchasing the remainder on a gravity scale basis at a price 2 cents per barrel below the price paid by Sun Oil Co. In a petition filed with OPA, Standard indicated its willingness to pay and absorb an increase of 2 cents per barrel and Amendment 20 was issued accordingly.

War Petroleum Corp. Gains Coordinator's Favor As Way To Maintain Oil Supplies

By HENRY D. RALPH

THE COORDINATOR SAID:

Gleanings of information drawn from Secretary Ickes when questioned by the House committee on banking and currency during hearings on the War Petroleum Corp. bill included these points:

Less than 10 per cent of the total shipments of oil to the Atlantic seaboard is moving by ocean tanker at present.

Barges on inland and coastal waterways are now moving 8 per cent of this total, but this movement will be increased soon.

A 24-in. pipe line from East Texas to the Atlantic seaboard refineries could move oil at a cost slightly below the normal cost of tanker shipment.

The Office of Petroleum Coordinator has spent about $1,750,000 since it was created on May 29, 1941. It has about 500 paid personnel and expects to add some 200 more during the coming year. Passage of this bill would require about 100 additional employes.

Coordinator Ickes spends between 75 and 80 per cent of his time on problems of the oil industry, and the balance on his varied duties as secretary of the interior, Solid Fuels Coordinator, and a member of the Cabinet.

WASHINGTON, D. C.—Financial relief for excess costs to the oil industry caused by disruptions growing out of the war seems likely by means of the Connally-Steagall bill now being considered by the House committee on banking and currency.

Early enactment of the legislation could hardly be predicted from the apparently hostile attitude of committee members during the first few days of the hearings, but the bill appears to have strong political backing and there are optimistic predictions that it will be law within a month.

The bill (S. 2562 and H.R. 7216) proposes to create a War Petroleum Corp., financed by the Government and headed by the Petroleum Coordinator for War, empowered to make loans, buy and sell petroleum and its products, and in various other ways assure an adequate supply of oil for military, industrial and essential civilian requirements.

Ickes Endorses Bill at Hearing

Petroleum Coordinator Ickes strongly endorsed the bill at the opening of the hearings. He revealed that the outline of the bill was submitted to him by Sen. Tom Connally of Texas and its language was drafted by the legal staff of the Office of Petroleum Coordinator. Rep. Henry B. Steagall of Alabama, chairman of the banking and currency committee, explained that he introduced the bill in the House at the urgent request of the speaker and the majority leader. Several members of the committee said they are receiving many requests from their constituents for its early enactment. Mayor Fiorello H. LaGuardia of New York, a former member of Congress, appeared before the committee in behalf of the measure and its passage is urged by a committee of eastern mayors concerned with the petroleum supply.

The chief concern of the committee to date seems to be whether or not the bill is a subsidy to the oil industry. Secretary Ickes insisted that it is not a subsidy, but a reimbursement for costs due to the war; that oil companies will not make a cent out of it and that if any one is subsidized it will be the consumers.

The committee, accustomed to handling technical banking legislation and authorizations for the Reconstruction Finance Corp., appears to be none too familiar with the oil industry, and questioning at the hearings frequently goes far afield from the subject matter of the bill.

In opening the hearings Secretary Ickes said he had not asked for this legislation, but it appeared to be a satisfactory solution to many problems facing the oil industry. If it is not enacted, he said, there will be many bankruptcies in the oil business and then a few strongest companies will have a monopoly of the business, but he warned that even the strongest oil companies cannot continue indefinitely to do business at a loss.

"The Government is not asking any other industry to supply an essential war material at below its costs, not a single one," the coordinator declared.

No Subsidy Provided

Reiterating that the bill does not provide a subsidy but would merely take care of costs incurred by the oil industry in obeying orders of the Government, Mr. Ickes said he would prefer that additional transportation costs be met by increased prices to consumers, except that this would upset the general price ceilings. He added that this would not take care of extra costs to refiners in changing runs to make more fuel oil and less gasoline, and that this is a general war cost and should not be borne by consumers. He insisted he was not pleading for the oil companies but is interested only in getting the oil needed to win the war.

A similar-stand was taken by Mayor LaGuardia, who said he was not seeking any favors for the oil industry but that something must be done to cover the costs caused by war dislocations. Oil companies have made efficient use of available transportation facilities to move petroleum products to the East within the limitations of cost, he said, but unless there is government action to make up the losses incurred in this transportation the eastern seaboard will suffer a fuel shortage this winter which will threaten its health and the operation of war industries.

"This bill will do the trick," he said.

The mayor told the committee that the cost of reimbursing oil companies for overland movement oil will be infinitesimal compared with the hazards of an oil shortage in the East, and that the nation will have to pay this cost whether this bill is enacted or not. He said the bill does not propose a subsidy to the oil industry but constitutes part of the inevitable cost of the war.

Mr. Ickes' Statement

Excerpts from Coordinator Ickes' testimony regarding the proposed bill follow:

The full impact of war conditions has seriously jeopardized the maintenance of an adequate supply of vital petroleum products, including aviation gasolines, fuel oils, and motor fuels, as well as toluene for TNT and butadiene for synthetic rubber. The loss of a substantial portion of the tanker fleet, which normally provides the heavily industrialized East and West coasts of the nation with their required quantities of petroleum and petroleum products, has not only created serious shortages of these products in these areas, it has impaired the sufficiency of petroleum and petroleum products at other strategic locations throughout the nation.

The proposed bill provides clear-cut and definite means by which positive solutions can be found to minimize present and prevent, so far as possible, future shortages of petroleum and petroleum products. In my judgment, the public interest is far better served by positive legislation that seeks to solve wartime shortages than by negative prohibitions which aim merely at ameliorating the effects of such shortages.

The proposed legislation is aimed directly at solving present and prospective wartime shortages of petroleum products while at the same time preventing the threatened elimination from the petroleum industry of the small independent producers, refiners, and marketers. The corporation would be charged with the specific duty of causing (1) the delivery of supplies of petroleum and petroleum products into shortage areas to meet military and essential civilian demands, (2) the expansion and most efficient use of petroleum transportation facilities, (3) the production of the necessary amounts of the specific petroleum products required for the war program and to meet essential civilian demands, (4) the maintenance of adequate reserves of such petroleum or petroleum products as are of strategic importance in quality or as to location, and (5) the return, upon such terms and conditions as will protect the public interest, to the natural underground reservoir or other disposition of petroleum products purchased by the corporation for the purpose of assuring the production of other essential petroleum products.

Powers of Corporation

For the sole purpose of accomplishing these objectives, the corporation would be empowered to make secured loans, to purchase and sell petroleum and petroleum products, to transport and store petroleum both above and underground, and to pay transportation charges covering the movement of petroleum products. Although the corporation would be permitted to purchase petroleum products from producers at prices in excess of those prescribed by the Office of Price Administration, the corporation would be prohibited, in making purchases or paying transportation charges, from paying more than is necessary to cover the actual excess cost experienced by the operator as a result of complying with governmental directions with respect to the quality or quantity of the oil or its products produced or means of transportation employed.

At the moment there exists no over-all shortage of crude petroleum as it comes from our wells. But the continuance of this condition depends upon two fundamental factors—how long the war lasts and how well we use and conserve our existing wells and reserves. With the loss of the oil of Burma and the Dutch East Indies and the disruption of tanker movements from sources of supply in South America, the United States

has suddenly become the only adequate source of supply not only for its own vastly increased domestic consumption, but also for the armies, navies, and air forces of the United Nations throughout the Pacific and the Atlantic. Thus, even though our present daily potential capacity to produce crude oil is large, it is significant that this capacity is invariably expressed in barrels per day, not in barrels per year or barrels for the 2, 3, or 4 years that the war may last.

In situations such as these, it is obvious that motor fuels and other byproducts of crude oil ought not to be burned or poured on the ground. Rather they should be stored against the day which is likely to come sooner than later when they will be needed both to fight the war and to supply the American consumer. This the British are already doing in the oil fields of Iran and Iraq by pumping the presently unneeded byproducts of crude oil back into the underground reservoirs from whence they came and from which they can be produced again whenever the need arises. Under the act now in question, it will be possible for the Government to sponsor similar necessary undertakings by lending funds and securing the repayment of such moneys out of the proceeds of the products stored underground at the time they are reproduced.

West Coast Situation

Thus far, reference has been made to the situation where it is necessary to produce a greater volume of crude oil than the sum total of the derived products which can be used or transported. The reverse has already occurred in certain areas where it is and will be necessary to stimulate additional production of certain special kinds of crude oil. Such a condition today obtains on the West Coast where the large demand for additional Navy fuel oil requires the production of more heavy crude oil. Here it is the old pumping wells which have reached the "stripper" stage that must provide the answer. But these wells are largely owned by hundreds of small independent operators. In order to recondition their wells, they must either be loaned funds, again secured by the proceeds of the oil when produced, or they must perhaps be paid a small bonus for increased quantities of such crude oil. Either or both of these methods of causing an increase in the production of such an urgently necessary war commodity could be quickly arranged under this act.

Casual mention has already been made of the wartime problem of assuring a proper balance of the particular kinds of the products manufactured from raw crude oil. That problem, as heretofore indicated, can be solved in part by altering the kinds of crude oil produced. But still more can be done inside the oil refineries. For refineries can be operated in different ways to yield different percentages of gasoline, kerosene, heating oils, and fuel oils from the same crude oils. Today, as a nation at war, particularly on the East Coast for next winter, more fuel oil and less gasoline is needed. Without sufficient fuel oil our war industries may be shut down and our homes go cold. The tankers which formerly brought large supplies of these products to the North Atlantic from South American sources are and no doubt will continue to be busy elsewhere supplying petroleum products to our fighting forces on far-flung battlefronts. This means that American refineries, particularly those on or near the East and West coasts, must make more fuel oil and less of something else out of the same number of barrels of crude oils which they possess.

Thus far, in response to my requests as petroleum coordinator for war, the oil refiners have shifted their operations to make more fuel and less gasoline. By reason of the present price ceilings, they are permitted to charge up to 6 or 7 cents a gallon for gasoline at the refinery but only 2 to 2.5 cents a gallon for heavy fuel, depending upon the location of the refinery. How long can even the strongest unit continue, in effect, to convert a 7-cent product into a 3-cent product when his investment and operating costs are predicated upon maximum production of the 7-cent product? The small independent refiners can obviously not afford it at all.

In so far as it is found necessary, in order to bring about the manufacture of increased quantities of low-value products, for the Government to pay prices somewhat above those prescribed by the price administrator, the corporation created by this bill would suffer losses. But since the price paid by the corporation could be only high enough to defray the increased cost of manufacturing increased quantities of designated products, this could hardly be deemed a subsidy. It is only—as it should be—a means of spreading excess war costs over the country as a whole rather than of laying such costs upon any particular section or any particular segment of consumers. Moreover, unless the Government were prepared to take over the oil industry and run it at a loss, this is probably the only effective way of assuring continuously and adequately the supplies of necessary petroleum products with which to win the war.

It is in the field of transportation, of course, that we have thus far been beset with some of the most serious problems of petroleum supply. Here the difficulties have been both physical and economic. Normally over 90 per cent of all the crude oil and its products consumed on the East Coast was transported there by tankers at an average cost of approximately 20 cents per barrel. As tanker shipments have dropped to a small fraction of their former volume, it first became necessary to search for physical substitutes for these tankers. Tank cars have proved to be the most readily available substitute facilities. Whereas, formerly only a few thousand barrels of oil and its products moved short distances by tank car into the East Coast area; now, after months of strenuous effort, some 700,000 bbl. per day are moving eastward by this means—much of it from points over a thousand miles away—from Texas, Oklahoma, Kansas, Louisiana, and Arkansas. Soon it is hoped that reversed, reconditioned, and new pipe lines and barges may add to the overland supply, but even with all that can be done in these directions, primary dependence on at least the present volume of tank-car movements seems certain until the end of the war.

So long as we live in a free economy there is bound to be the closest possible interconnection between what can be done physically and what can be done economically. This is another way of saying that private concerns cannot long continue to do what they cannot pay for. It used to cost about 20 cents a barrel to haul crude oil or gasoline, or fuel oil from Texas, the principal source of supply, by tanker to the East Coast. It now costs approximately $1.67 to move a barrel of fuel oil from Texas to Philadelphia or New York by railroad tank car.

The fuel oil sells for approximately 85 cents a barrel on the Gulf before it is loaded into tank cars. After it reaches the East Coast, and is delivered to the consumer, it sells for only $1.80 per barrel.

It is all too obvious that this cannot long continue. Indeed the small independent marketer and distributor are already dropping by the wayside. During the last few weeks instances of impending bankruptcy have been presented to my office by independent distributors in New England, the Middle Atlantic states, and as far south as Georgia and Florida. As they drop out, their facilities for serving the public with absolutely necessary fuel oils and other petroleum products will either go with them into disuse or be bought up by the larger companies. Yet even the large companies will not be able to stand the drain of paying out more cash than they receive for any very protracted period and certainly not for as long as the war is likely to last.

This bill proposes to deal with the problem of transporting oil in the same manner as in the case of refiners who are asked to produce more fuel oil or other low-value petroleum products. It, in effect, authorizes the War Petroleum Corp. to pay no more than the difference between the tanker rates prevailing at the time when oil was still moving in substantial volume by tanker, and the very much higher rates now or later prevailing for tank-car or other abnormal methods of movement.

In conclusion, it must be readily apparent that these problems of assuring our petroleum supplies in all of their many forms and in all of the many places where they are needed, are complicated in the extreme. This bill would place that responsibility upon the Office of Petroleum Coordinator for War. It is an enormous responsibility. If the Congress desires us to undertake the task, we shall try to discharge it, honestly, fearlessly, efficiently. We would have the advantage of a full year's experience in dealing with the problems and a staff of experts thoroughly grounded by years of experience and training in the technology, economics, and practical aspects of this tremendously important undertaking. Certainly unless positive action is taken in this field, we must all steel ourselves to face a whole series of probably unnecessarily stringent rationing orders and perhaps actual shortages of petroleum or some of its products for direct military use.

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Foreign Priority Branch Established by War Board

WASHINGTON, D. C.—Establishment of a Foreign Requirements Branch in the Bureau of Priorities was announced today by Henry Nelson, assistant bureau chief in charge of requirements.

The new branch will be headed by Fred Lavis, Jr., Mount Kisco, N. Y., who has been a priorities specialist in the automotive branch of OPM and WPB since September 1941.

The Foreign Requirements Branch will serve as liaison on priority matters between the War Production Board, the Lend-Lease Administration, and the Board of Economic Warfare, and will receive all applications for priority assistance from foreign governments or purchasers in foreign countries (except Canada) received through these agencies. In cooperation with existing agencies, the Foreign Requirements Branch will develop improved procedures for handling priorities on materials and products for export.

One of the chief purposes of establishing the new branch is to obtain a more complete picture of foreign nonmilitary requirements so that they may be related to the broad policy on distribution of materials and products established by the WPB. One of the functions of the Foreign Requirements Branch will be to obtain from foreign purchasers, BEW and Lend-Lease, information as to requirements by calendar quarters. In this way, foreign requirements can be correlated with domestic requirements, as determined under the recently announced extension of the Production Requirements Plan covering major users of metals in the United States. Formation of the new branch thus constitutes a further step toward bringing total demand for which priority assistance can be granted into line with available supplies of scarce materials and products.

New water-pressure plant in the Bradford, Pa., oil fields. This plant, largest in the field, has been in operation less than a year

Demand for Heavier Lube Oils Aids Pennsylvania Refiners

By J. P. O'DONNELL

OIL CITY, Pa.—War has brought a marked change to the Pennsylvania Grade crude-oil region and so far most of it has been improvement. Under normal circumstances gasoline, in particular and fuel oil at times, have been problem products. The trend to lighter oil for motor cars also posed a problem because the yield of heavier bright stock is approximately double that of neutral. Both of these conditions have been reversed by the war.

The change in the lubricating supply situation is a result of the large increase in demand for aviation oils in which a larger proportion of bright stock to neutral is used than in motor grades. This has opened up a new market for bright stock with the result that, at present, it is in a stronger position than neutral. This is apparent from the fact that while inventories of Pennsylvania bright stock declined about 10 per cent in May, inventories of neutral rose approximately 25 per cent.

Bright-Stock Demand Rises

While demand for bright stock has risen, requirements for neutral have declined. The decline in the latter is a result of the curtailed motor-car market, reduced by gasoline rationing and the rubber shortage. Further indication of the change that this has brought about is shown in a comparison of inventories as of May 31, 1942, with those of a year earlier. This year, finished Pennsylvania bright-stock inventories totaled 252,654 bbl. against 351,450 bbl. a year ago, off 28 per cent, while neutral inventories were 205,775 bbl., against 150,508 bbl. a year ago, up almost 37 per cent.

The East Coast shortage has eliminated all problems with respect to gasoline and fuel oil. Suspension of shipments from the East Coast refining district into western New York, western Pennsylvania, eastern Ohio and West Virginia and curtailed shipments eastward from interior refining districts due to transportation difficulties have given the Pennsylvania region refineries a market that should remain at least for the duration of the shortage. Nation-wide rationing of gasoline could, of course, alter this picture so far as this product is concerned. Tank-car prices ranging from 5.5 cents on fuel oil to 7.75 cents for gasoline are not, however, profitable in themselves with Bradford crude selling at $3 per barrel in the fields.

Another product of which Pennsylvania refiners are important suppliers and which continues to experience a good demand is wax. Despite May's comparatively high rate of refinery operation, wax stocks again declined about 5 per cent to 2,958,366 lb. which compares with 6,938,623 lb. on May 31 last year. Comparative data on Pennsylvania inventories are given in Tables 1 and 2 which shows stocks of Pennsylvania lubricating oils and of products other than lubricating oils at region refineries only. These tables compare May 31, 1942, stocks with those of April 1942, and May a year ago.

TABLE 1—PENNSYLVANIA LUBE-OIL INVENTORIES

(All data in barrels)

	May 1942	April 1942	May 1941
Raw long residuum (includes all raw long residuum below, and not salable as, 600 fire)	60,379	63,088	38,081
600 steam-refined stock (includes all steam-refined stock commonly sold or used as raw material for bright stock)	282,806	266,722	265,824
Other steam-refined stock not included above	93.817	90,360	93,850
Finished dewaxed long residuum	57,031	46,547	37,018
Bright stock (does not include any material reported above)	252,654	280,770	351,450
Viscous neutral (below 180 vis. but not below 142 vis. at 100°)	90,472	74,811	58,049
Viscous neutral (180 vis. at 100° and above)	115,303	86,776	92,459

TABLE 2—PENNSYLVANIA REGION OIL INVENTORIES OTHER THAN LUBE OILS

(All data in barrels)

	May 1942	April 1942	May 1941
Naphthas and gasoline:			
Straightrun, unblended and unleaded for sale as motor fuel	6,682	43,539	23,537
Naphtha and gasoline for sale for blending or further refining or held at refinery for further distillation, reforming, blending or leading	133,066	188,402	201,809
Below 65 octane, not included above	14,349	13,156	7,671
65 octane and higher	388,071	480,187	341,392
Salable naphthas (nonmotor-fuel material)	30,321	23,346	24,690
Kerosene	76,252	75,823	69,035
36-40 gas oil (includes furnace oil)	75,210	77,157	47,131
Fuel oil (not reported above)	44,039	42,800	24,459
Cracking plant charging stock	242,117	264,261	312,066
Nonviscous neutral	39,199	35,084	19,605
Wax distillate	113,926	95,884	88,717
Crude petrolatum	20,852	25,976	13,766
Wax (pounds)	2,958,366	3,125,348	6,938,623

These promising surface indications do not mean that the Pennsylvania refiners will escape the effects of war without losses. One of their principal problems over the years has been the maintenance of market outlets. Gasoline restrictions have already cost them some of their outlets and, if nation-wide rationing is invoked, further and possibly very serious losses would be probable.

Refinery Runs Increased

Restrictions on the use of metal with the consequent elimination of cans for motor oil will also be a blow to the Pennsylvania refiners. Many retail outlets are not equipped to dispense motor oil except in cans and equipment to handle bulk oils is unobtainable. Some means of overcoming this problem will have to be developed. One company has adopted a 1-qt. bottle that will solve the problem for it but only at considerable expense. Other companies are considering similar steps but apparently have not yet reached a decision.

In order to meet the war demands for lubricating oils and to aid in supplying the shortage area, Pennsylvania refiners have stepped up runs to stills. Runs averaged 83,000 bbl. per day in May, according to preliminary estimates, and in the first 3 weeks of June they were 83,800 bbl. per day. These figures contrast with 79,100 bbl. in April and 78,900 bbl. daily in March. Production rose appreciably in April but slumped again in May. Daily average production in May is estimated at 78,900 bbl. against 83,100 bbl. in April

(Continued on Page 21)

STATE CAPITALS...

TEXAS

A COMPLETE REVISION of rules regulating handling of casing and tubing in oil wells has been made by the Railroad Commission. One of the main changes authorized by the commission from previous rules is that operators may, under revised Rule 12, set tubing as much as 100 ft. above the top of a producing sand or 50 ft. above the top of blank liner. In its previous form, Rule 12 had specified that tubing should be set no higher than the top of the sand or not higher than top of the blank liner.

Text of the revised Rule 12, provides:

"(*A*) Any well drilled in any field or area shall be required to set and cement a sufficient amount of surface casing to properly protect fresh-water sands which are or may be a source of water supply for the area or field. Cementing shall be by pump method and sufficient cement shall be used to fill the calculated annular space back of the casing to the surface of the ground or to the blowout preventer, shall be of such type of construction and operation as to satisfy any test which may be required by the commission or its duly accredited agent. Exceptions to cementing requirements called for in this rule may be granted by the commission on application and recommendation of deputy supervisor in charge of the area.

"(*B*) In any well drilled in any field or area the producing string of casing shall be cemented by the pump and plug method, or another method approved by the commission, with sufficient cement to fill the calculated annular space back of the casing to a point at least 600 ft. above the shoe. Where 3,000 ft. or more of pipe is set for the producing or protecting string a minimum of 30 ft. of cement shall be left inside the pipe. Before drilling the cement plug in the producing string of casing, the casing shall be tested at a pressure in pounds per square inch calculated by multiplying the length of the producing string by 0.2 with the maximum test pressure required, unless otherwise ordered by the commission, not to exceed 1,500 lb. per sq. in. If at the end of 30 minutes pressure shows a drop of 150 lb., or more, the casing shall be condemned. After corrective operation the casing shall again be tested in the same manner. Bailing test may be used by reducing the fluid level in the hole to a point at least midway between the calculated top and bottom of the cement columns on the outside of the string being tested. After such bailing test, casing shall set 12 hours before the cement plug is drilled. If fluid level shows a rise equivalent to 2 per cent of the bailed distance casing shall be retested. If second similar test shows leaky condition casing shall be condemned and casing clearance shall not be issued until condition is corrected. Christmas-tree fittings or well-head connections shall have a test pressure at least equivalent to the calculated pressure in the reservoir from which production is expected.

"(*C*) All flowing wells shall be equipped with and produced through tubing of not larger than 2½ in. nominal diameter. The bottom of the tubing shall be at a point not higher than 100 ft. above the top of the producing sand or not more than 50 ft. above the top of blank liner.

"(*D*) Any well produced by means of artificial lifting devices shall be equipped with and produced through tubing of not more than 2½ in. nominal diameter. Exceptions to this subdivision may be granted by the commission upon receipt of written application.

"(*E*) When it is desirable to use a casing pump (no tubing required) the working barrel of said casing pump shall not in any case be of larger diameter than that authorized for wells being pumped through tubing. Exceptions as to the size of the working barrel of casing pumps and tubed wells may be granted by the commission after proper showing."

Since the middle of 1940, an exception to Rule 12 has permitted East Texas operators of pumping, plunger-lift, or gas-lift wells to bottom tubing strings higher than the top of producing sands subject to approval of the deputy supervisor.

THE GULF BETWEEN the Railroad Commission and the Office of Petroleum Coordinator in opinions as to what the state's crude-oil production should be has been terminated, at least temporarily.

The July order issued June 22, provides for daily crude-oil production of 1,184,711 bbl. Condensate and natural-gasoline yield is estimated at 100,000 bbl. daily. The commission discounted the allowable-crude production by 75,229 bbl. daily, assuming that the average under production of 6.35 per cent would prevail, leaving a net figure of 1,109,482 bbl. of crude daily.

The Texas figure is approximately 5,000 bbl. per day under the quota of 1,214,400 bbl. for crude and other liquid petroleum products certified for July by the OPC.

Shut-down days for the state, outside East Texas, are July 4, 5, 11, 12, 18, 19, 25, 26, 29, 30, and 31. In addition to the 11 shut-down days for all regular fields, East Texas will be idle July 6, 13, and 20, or a total of 14 for that area.

Appointed New Administrator

W. R. WARDNER, who has been assistant administrator of the Conservation Committee of California Oil Producers, Los Angeles, has been appointed administrator, succeeding L. P. St. Clair, who resigned because of ill health. Paul Huggins, Western Gulf Oil Co., is the new chairman, succeeding Lloyd Williamson, California Star Oil Co. The allocation committee of the organization appointed for the coming year includes L. E. Porter, Warner Clark, J. B. Wharton, E. B. Hall, J. L. Stephens, D. K. Weaver and H. C. Pyle

ARKANSAS

ALLOWABLE PRODUCTION in Arkansas' three large sour-gas fields was lowered more than 50 per cent by the July proration order issued last week. The daily allowable for the state in July was fixed at 73,915 bbl., 4,585 bbl. below the quota certified by the Office of Petroleum Coordinator and 1,395 bbl. per day below the June state authorization.

Lower allowables assigned to Dorcheat, Macedonia and McKamie will have the practical result of reducing the volume of gas discharged to the atmosphere from 50,000,000 cu. ft. daily under the June order to approximately 14.000,000 cu. ft. this month.

Consideration had been given to an order requiring the three sour-gas fields to suspend production until the desulfurization projects are completed. Plants are now under construction that will remove the hydrogen sulfide and make the gas available for industrial consumption in southwestern war plants.

The commission recommended that Dorcheat and Macedonia operators immediately effect a unitization program.

LOUISIANA

SCHEDULES ALLOWING crude-oil production in July at the rate of 323,997 bbl. daily were issued last week by the Conservation Commission, but the net output will be around 300,600 bbl. daily because of underproduction and pipe-line proration. In addition to the net output of crude, yields of natural gasoline, condensate and distillate will bring the aggregate production of all petroleum hydrocarbon liquids up to the OPC certified quota of 319,600 bbl. daily.

The proration schedule provides production of 238,648 bbl. daily from South Louisiana fields, divided as follows: Houma, 45,527 bbl. daily; Lafayette, 93,646; Lake Charles, 44,632, and New Orleans district 52,843 bbl. daily.

North Louisiana's total allowable is distributed 29,671 bbl. daily to the Monroe district and 55,678 to the Shreveport region.

CALIFORNIA

CALIFORNIA HAS BEEN ASSIGNED a daily quota of 739,500 bbl. of crude and other liquid-hydrocarbon production in July.

The District 5 production committee, headed by E. E. Pyles, estimates that 40,100 bbl. of this daily quota will be reserved for natural gasoline and condensate production, leaving a net crude-oil allocation of 699,400 bbl. a day. In June the total allocation was 691,900 bbl. daily and net crude-oil allocation was fixed at 653,000 bbl. daily.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Define the Bill

The petroleum industry should insist on a comprehensive statement from those who are sponsoring the Connally-Steagall bill as to how its provisions would be applied and what the full purpose of the legislation is.

The bill is couched in the usual general terms of war measures which means that its real meaning will come largely from those who enforce it—in this instance, the Office of Petroleum Coordinator for War. The bill would create an initial half-billion dollar war corporation fund which would be used in financing petroleum operations, including protection for those who suffer losses due to war developments.

It has been clear from the start of the defense program, and later the war production plans, that certain petroleum activities should be financed by the Government as part of the war cost. Individual companies could not be expected to furnish the funds for the quarter-billion-dollar construction program to supply the United Nations with 100-octane gasoline.

The same situation applies to the synthetic-rubber projects which will involve capital outlays three or four times those of aviation gasoline. The manufacture of explosive materials comes in the same category. Neither should operators be expected to finance the laying of new pipe lines and the relaying of existing lines promulgated solely to serve war needs. Financing, incidental to the construction and operation of most of these projects, has already been provided through the Reconstruction Finance Corporation.

But the Connally-Steagall bill would go much further than this. The bill itself and the discussion of its provisions by the petroleum coordinator last week leave the impression that the proposed act is designed to be broad and flexible enough to cover practically any expediency in petroleum's war operations.

There is danger to the petroleum industry in delegating additional authority over its operations based on subsidies or war grants from a government agency, including one as friendly and as informed as OPC. This is particularly true when it has not been established that there is no better way to solve most of the problems that are already here and those that will develop from month to month throughout the emergency.

Admittedly cases can be cited in which there does not appear to be a practical method of compensating operators for war losses except from a government fund. This applies to local situations such as those confronting producers and refiners who have lost most of their markets due to changes brought about by the course of war.

The proposed act would apply war payments to all extra costs in producing, refining and transportation, with a continuance of price ceilings. Sponsors emphasize that the war payments would be confined to activities which contribute directly to the war effort.

The start is clear in the application of this act, but where would it end? It is stated that jobbers and dealers who will be put out of business, due to rubber and gasoline rationing, would have no valid claims against the war corporation. Tens of thousands of these units of distribution might have a different viewpoint. The political reverberations from this situation and others which will arise should be readily apparent.

A majority of the oil industry unquestionably favors higher prices to cover the extraordinary costs of war so far as all general operations are concerned. There will be difficulties in the equitable application of these price adjustments but these complications will be minor compared to those which will arise from a program of war payments. The scope of the Connally-Steagall bill needs to be clearly defined and time given for complete discussion before it is made part of the war-operation plans of the petroleum industry.

Sharp Price Rise Approved To Offset Rail-Shipping Costs

WASHINGTON, D. C.—The Office of Price Administration authorized, effective June 29, an increase in the prices of gasoline, kerosene, and light fuel oils in the East Coast curtailment area in order to compensate shippers for the higher cost of overland transportation.

The permitted increases are 2.5 cents per gallon on gasoline, and 2 cents per gallon on kerosene, range oil, tractor fuel, distillate-diesel fuel oils, gas oils, and Nos. 1, 2, 3, and 4 fuel oils. No increase was authorized on residual fuel oils.

The increases were provided through amendments to OPA Price Schedules 88 and 137, making them apply both to wholesale and retail prices.

In announcing the increases, Price Administrator Leon Henderson made it plain that he preferred a government defrayment of higher costs to a price increase but that "arrangements could not be worked out at this time." The tank-car pool is said to have a deficit of between $40,000,000 and $50,000,000, and the increased prices are calculated to permit these losses to be recouped. Since price ceilings were imposed on petroleum products, OPA has permitted small increases in the East on three occasions, but these were not sufficient to absorb losses incurred by constant expansion of tank-car deliveries and OPA was committed to a policy of offsetting extraordinary transportation charges.

Henderson's Comment

In announcing the price increase, Mr. Henderson said:

"The Office of Price Administration is keenly aware of the inequity of making consumers of petroleum products bear the entire cost of the submarine warfare against tanker movement along the eastern coast. It is my own feeling, and one which I am sure is widely shared, that the higher cost of getting petroleum to the East Coast resulting from enemy action is an appropriate charge against the public enemy, just as is the cost of patrol boats with which we sink the submarines.

"Moreover, price increases of this sort have a bad dislocating effect on the whole cost situation of industries operating under our ceilings. Waterborne fuel oil, for example, delivered at tanker rates is an economical fuel for most industries. Should it have to carry, even temporarily, land-transportation rates, this would have a serious effect on prices charged by the industries which use heavy fuel oil. The fact that these increased fuel costs are temporary makes it especially desirable that the Government absorb the higher costs rather than have them translated irrevocably into higher prices all along the line.

"In the present situation, we have corrected this to the best of our ability by loading the increased cost on to gasoline and light fuel oils where it will not be pyramided. Admittedly, however, this is not a satisfactory solution. I hope a permanent solution will be forthcoming for this and similar problems in the future."

Procedure under which OPA makes the price adjustments is as follows:

Amendment No. 21 to Revised Price Schedule No. 88 (Petroleum and Petroleum Products) grants the increases to producers and other suppliers of gasoline, kerosene, and distillate fuel oils, and requires them to notify retail-store and service-station operators that corresponding increases are permitted to such operators.

Amendment No. 4 to Maximum Price Regulation No. 137 (Petroleum Products Sold at Retail) permits increases in service-station and store sales of gasoline, diesel fuel oils, No. 1 fuel oil, range oil, and kerosene identical with those permitted suppliers under the amendment to Schedule No. 88.

The amendment to Regulation No. 137 also takes sales of petroleum products at retail establishments from coverage under the General Maximum Price Regulation and establishes maximum prices for such products.

Transportation by rail has increased many times the cost of moving petroleum and petroleum products to the eastern states. A plan for handling these increased costs is now in operation, involving a pooling agreement which provides for an equitable sharing of revenues and excess transportation expenses by the oil companies supplying the Atlantic seaboard.

The plan was inaugurated at the instance and with the approval of the Office of Petroleum Coordinator to assure movement of necessary petroleum and petroleum products. The Price Administrator agreed at the time of the formation of the pool to permit such price increases as needed to compensate for the increased cost of the abnormal movement, providing other means of absorbing additional costs were not available.

In line with that policy, and because of the increasingly critical situation on the East Coast due to the war, OPA on January 21, approved an increase of 0.3 cent per gallon for gasoline in the restricted area.

Petroleum and petroleum products generally were placed under formal ceiling prices on February 2, 1942, at levels which had prevailed in the period October 1-15, 1941. Before the end of March the additional costs of moving petroleum and petroleum products into the eastern area necessitated increases of 0.5 cent per gallon on gasoline; 0.4 cent per gallon on kerosene and distillate fuel oils, and 20 cents a barrel on residual fuels.

Permit Price Exceeding Ceiling

Gasoline service stations in the same area were permitted to add 0.5 cent per gallon to the posted prices for gasoline which had been "frozen" at the March 13 level.

Additional transportation costs due to the abnormal movement by rail brought permission on April 29 for further increased prices in the eastern area as follows: gasoline, 0.4 cent per gallon; light fuel oils, 0.2 cent per gallon; and residual fuel oils, 25 cents per barrel.

These increases, however, failed to meet the extraordinary transportation costs incident to use of tank cars to supply the critical needs of the East.

The eastern seaboard area in which the price adjustments are effective is made up of the States of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, West Virginia, and Georgia, that part of Florida east of the Apalachicola River, the District of Columbia, and the city of Bristol, Tenn.

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Rubber Drive Extended Ten Days; Eastern Districts Lag

THE drive for reclaimed rubber was extended by executive order of the White House early this week for 10 days, carrying the campaign through July 10 in order to give states in which results have been disappointing additional time for organization.

When a second interim total on collections throughout the country was reported last Saturday, the accumulation of scrap rubber during the drive stood at 219,000 tons, approximately half of what some observers had anticipated and less than a third of the figure that the most optimistic had anticipated. National figures on scrap indicated that the densely populated eastern states were making the poorest showing. This was glaringly evident by the comparison between Texas, which had collected the second largest state total through last Saturday and New York. Texas, with only a fraction of New York's population, had collected 15,212 tons against 7,153 reported for New York. The comparative records of other densely populated eastern states were, in many instances, even less impressive.

W. R. Boyd, Jr., chairman of the Petroleum Industry War Council, and Petroleum Coordinator Ickes prevailed upon President Roosevelt to extend the campaign 10 days in order to allow time for the organizations in all states to reach maximum efficiency. The original period assigned for the scrap drive of 2 weeks was considered from the start as inadequate in sections of the country where organizations had to be created and educational work packed into so brief a time. The figure reported last Saturday of 219,000 tons was, at the best, an estimate and included the bulk weight, meaning that reclaim rubber derivable from the materials collected will be substantially lower.

Oil companies throughout the country continued to impress upon citizens through every communication medium at their disposal that upon success of the scrap rubber drive depends the issue of rubber for tires of civilian automobiles. The alternative to adequate scrap collection, it was feared by oil companies, is nation-wide rationing of motor fuel to conserve rubber.

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Migratory Farm Workers Granted Extra Gasoline

WASHINGTON, D. C.—Migratory farm workers, now engaged in harvest activities in many sections of the East Coast gasoline-rationed area, may obtain whatever supply of motor fuel they need to travel from job to job, the Office of Price Administration has ruled.

OPA's statement, based on regulations governing the emergency plan for gasoline rationing, assured farmers needing the help of migratory workers during the summer season that they need not suffer hardship because of the gasoline-rationing program.

Minimum Eastern Ration Will Permit 2,880 Miles of Travel

WASHINGTON, D. C.—Further details of the coupon gasoline rationing system to go into effect throughout the East July 22 were made public during the week by the Office of Price Administration.

The effective date originally was fixed as July 15, and the postponement was explained as a means of permitting additional time for forming car sharing pools among drivers. Formation of such pools is a condition for obtaining supplemental "B" ration books for occupational driving, and the Office of Civilian Defense has announced machinery for assisting the formation of car sharing clubs.

The basic "A" books, issued to all drivers, will be good for 1 year and will contain 48 coupons each qualifying holders, for the present, to 4 gal. of gasoline. At an average of 15 miles per gallon, this is calculated to provide 2,880 miles per year, of which 1,800 miles is considered to be for occupational driving and the remaining 1,080 miles for general household purposes. Persons whose occupational driving exceeds 150 miles per month may, under prescribed conditions, obtain "B" books good for an additional 320 miles per month, or "C" books for even larger amounts. Both "B" and "C" books are normally good for 3 months, but their expiration dates may be extended by local rationing boards in order to "tailor" them to individual requirements.

Three Days for Registering

Registration for "A" books will take place July 9, 10, and 11 at public schools designated by local rationing boards, and applications for supplemental books must be made to the boards themselves in person or by mail. Other forms of ration books are available for commercial, governmental, nonhighway and other uses.

An important feature of the coupon system is that dealers must collect the coupons and turn them in, together with reports, before they may obtain additional supplies for their pumps.

The application blanks for supplemental rations, when filled out, are to be presented in person or mailed to a local rationing board for action.

Such applications may be filed with the board any time after the basic book is obtained. While local boards will receive applications beginning July 9, OPA pointed out that the filing need not necessarily be done before July 22, when the plan goes into effect. Holders of "A" books can use the first eight coupons in that book while they are in process of getting supplemental rations.

The "B" book of 16 coupons may be issued an applicant who shows that his occupational driving exceeds the 150 miles per month provided by his "A" book. This "B" book must last for a period of 3 months, thus giving the applicant 320 miles of additional driving a month. This mileage figure is reached by multiplying 16 coupons by 4 gal. by 15 miles to the gallon, and by dividing by 3 months.

Thus a total of 470 miles a month (150 from the "A" book and 320 miles from the "B") are possible for occupational driving under the plan. But an applicant who can show that he needs more than the "A" book, but less than the full amount of the "B" book will have his supplemental ration book "tailored" by extending the expiration date of the book beyond the 3-month minimum. A "B" book might be made to last 4 months, or 5 months, or 6 months, or a year. Local boards will be provided with tables determining the date of expiration on the basis of monthly mileage allowed in the application.

Before issuing a "C" book a local board must see that the applicant's needs cannot be met by an "A" book, or an "A" book plus a "B" book. In other words, his occupational driving must exceed 470 miles a month. He must also have met all the requirements for a "B" book, and in addition must belong to a category of users recognized as essential to the war effort and to the public welfare. Services for which "C" books may be issued include medical care, maintenance of public utilities, carrying farm labor, giving religious comfort or assistance, and making official trips on government business.

The "C" book will be issued for 3-month periods. While a full book will contain 96 coupons, the board will tear out coupons to "tailor" each book issued to fit the applicant's needs. More than one "C" book may be issued if necessary.

Local rationing boards are given specific instructions not only in considering applications for supplemental rations, but also in issuing rations for types of users other than those in the 'A," "B," and "C" and "D" groups. Such types include trucks, taxis, buses, hearses, ambulances, rental vehicles and government cars for which "S" books will be issued, and nonhighway uses for which "E" and "R" books will be issued.

All applications for "S," "E" and "R" books are to be made at the rationing boards July 9.

Trucks, taxis, ambulances and government vehicles may be issued one or both of the two types of "S" books. Operations of these vehicles will be controlled but, with some exceptions, will not necessarily be curtailed by the rationing plan. In no case, will rations provide for more mileage than applicants are permitted by orders or regulations of other government agencies.

The "S-1" book will have 96 coupons worth 5 gal. each, while "S-2" books will have 384 coupons of the same value. The coupon value is subject to change. Applicants may be issued either of the "S" books, or both, as may be needed to meet their requirements for a 4-month period. Individual requirements are to be met by tearing coupons from the books.

Nonhighway rations for inboard and outboard motor boats, farm machinery gasoline engines, cleaning and dyeing establishments, etc., will be issued through the "E" and "R" books good for a 6-month period. Each book will have 48 coupons.

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Well-Head Manufacturers Planning Standardization

A permanent program of standardization of well-head equipment, adoption of nomenclature, certified pressure testing, and other recommended practices, has been launched by the Association of Well Head Equipment Manufacturers, Houston, Tex. This program has resulted in the adoption of specific terms and definitions as well as a code of practices on the pressure-testing certification of well-head equipment. The association has officially adopted a monogram and seal.

The association standards are intended to provide greater interchangeability, more safety and economy of equipment.

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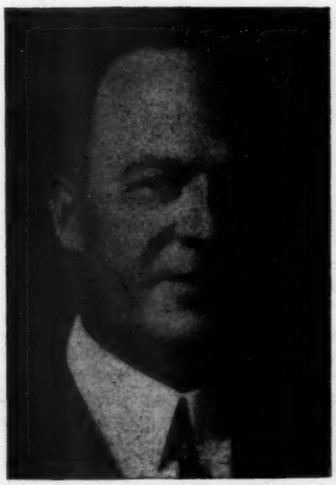
Specifications Due Soon For War Emergency Line

SPECIFICATIONS for the 24-in. pipe line from East Texas to Norris City, Ill., and extensions to Mount Vernon, Ind., and other nearby points in southeastern Illinois, will be distributed to contractors before this week ends.

Personnel of the War Emergency Pipe Line Corp. is now being assembled under the general management of B. E. Hull, president of the Texas Pipe Line Co. who is vice president of the corporation, directing the work from Houston.

No deadline has been specified for submission of bids on the construction work but this detail probably will be included in requirements of invitations to contractors. Meanwhile, most pipeline construction companies are analyzing their equipment and personnel for the purpose of being prepared to meet whatever bid deadline is specified in the forthcoming invitations.



Two of the key men in the War Emergency Pipe Line Corp. organization who are now directing the work preliminary to starting construction of the line. W. Alton Jones, left, president Cities Service Co., New York, is president of the pipe-line corporation and B. E. Hull, Houston, Tex., president of the Texas Pipe Line Co., is vice president and general manager. (See The Oil and Gas Journal of May 21, 1942, for a biographical sketch of Mr. Hull)

Adequate Steel Allocated for Industry's War Plants

WASHINGTON, D. C.—Sufficient steel is being allocated each month to permit completion of petroleum refinery projects scheduled to go on stream prior to July 1, 1943, it was declared here this week by the Office of Petroleum Coordinator, Division of Materials.

Improper distribution of orders among the mills, the OPC division pointed out, may delay deliveries of steel plate.

"In some instances," declared a statement from the division, "the delivery of the plate falls behind even though orders are scheduled because the particular mill with which the orders are placed has more work than it can do. In other instances, the plate deliveries are delayed because the purchaser requires an unusual width whereas the cutting and welding of plate of lesser width might fulfill the requirement.

"Each fabricator, each contractor and each principal engaged in the erection of these plants could do much towards the elimination of this difficulty if they would first contract the various mills, familiarize themselves with the current situation, place their orders with the mills that can best handle them and then file their PD-298 forms accordingly." Several other suggestions were made in the OPC statement, extracts from which follow:

Compressor Shortage Relieved

Some few weeks ago the various oil companies for whom war plants are being built were requested to list with this office any spare compressors which might be made available in their refineries, in their natural-gasoline plants, or in their producing fields in order that such spare compressors might be utilized in connection with war-plant construction. Compressors totaling 92,000 hp. were located.

It is the intention of this office to request similar listings on all other spare equipment or materials which may be made available in the various refineries.

General Petroleum Corp. at Torrance, Calif.; Magnolia Petroleum Co., Beaumont, Tex.; Phillips Petroleum Co. at Borger, Tex., and the Shell Oil Co. at Wilmington, Calif., have each reported that they were able to take care of practically all of their compressor requirements by utilizing spare compressors located within their own organization. The Shell Co. took care of part of their compressor load by adopting absorption refrigeration.

Early Valve Ordering Suggested

Last week a circular was sent to those engaged in the erection of war plants in which certain suggestions were made with regard to steps which might be taken in order to avoid a shortage in valves. The following day we were advised by the head of one of the large valve manufacturers that he did not have sufficient orders to keep certain of his shops busy.

A further review of our material lists clearly indicated that valves will be a bottleneck and a serious one at that. The difficulty at the moment comes from the fact that valves are amongst the last bits of equipment to be ordered for a given project. Generally the valves are listed only after the engineering work has been completed. This practice has proved to have been sound in the past. However, today many plants of identical design are being erected at several points and there would seem to be no reason why valves should not be ordered in advance. It is suggested, therefore, that valve orders should be placed as soon as possible.

Because the industry has been securing an even flow of steel plate, the impression has spread that the metal battle has been won. Steel is still a problem. It is not merely a matter of rolling, shaping, and fabricating steel; it comes right down to ingot production. Curtailment in the use of steel is the best way of solving the problem.

A survey of material lists covering all war plants to be erected within refineries which are projected for completion prior to July 1, 1943, indicates a total tonnage requested for all projects approximately as follows: Steel plate (sheared, universal and strip), 352,855 tons; structural-steel shapes, 202,223 tons; and sheet steel (black and galvanized, flat and corrugated), 14,249 tons.

Suggestion has been made that specifications for alloy tubes should be reduced from 16 to 6. Several of the tube manufacturers have indicated that this simplification would assist their production materially. Several of the petroleum refiners have indicated that the specifications suggested should cover every contingency. Listed below are the specifications which were recommended then and are being recommended now:

1. Low-carbon steel.
2. Low-carbon steel with ½ per cent molybdenum.
3. Two to 3 per cent chrome steel with ½ per cent molybdenum.
4. Four to 6 per cent chrome steel with ½ per cent molybdenum.
5. Seven to 9 per cent chrome steel with ½ per cent molybdenum.
6. Eighteen per cent chrome, 8 per cent nickel stainless steel.

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Greer W. Orton, Texas Co., Heads OPC Materials Branch

WASHINGTON, D. C.—Greer W. Orton, assistant manager of the purchasing department of the Texas Co., has been appointed director of the Division of Materials of the Office of Petroleum Coordinator.

He succeeds William F. Huff, who remains in OPC, with a title yet to be selected, to head up a drive in the oil and petroleum equipment industries for better distribution and utilization of materials and supplies.

Mr. Orton is a native of Nacogdoches, Tex., and a graduate of the University of Texas with the class of 1927. He entered the employ of the Texas Co. at Houston in 1928, serving in the comptroller's office at that place and at other points in the United States and throughout the world for the next 10 years. In 1938 he became assistant manager of the purchasing department in New York City.

Representatives of the petroleum and of the oil supply and equipment industries held extended conferences with Mr. Huff last week in an effort to develop a program for better use of material now on hand in order to lessen the demand for production of new equipment, particularly tubular goods. Apparently no definite agreement was reached, for Mr. Huff was instructed to try to work out a plan based on the suggestions and objections made at the conferences. This plan will be submitted to O. D. Donnell, chairman of the committee on production of the Petroleum Industry War Council, for discussion at the monthly meeting of the council this week.

The objective of the program which Mr. Huff is coordinating is to spread available inventories among the industry generally in order to get maximum utilization. The OPC recently made a survey of the inventories and requirements of the oil industry, particularly the production branch. The findings have not been made public.

An effort is being made to work out some form of joint organization for selling or loaning idle and excess inventories to operators who are in immediate need of equipment.

Emergency Oil-Rail Rates Are Extended; Traffic Increases

The petroleum industry received virtual assurance last week that the cost of shipping nearly 750,000 bbl. of oil daily over railroads between central, southwestern and eastern states will remain static through October.

Meanwhile, the upward trend of oil shipments via eastern railroads continued. Loadings of petroleum for eastern seaboard destinations averaged 731,760 bbl. daily during the week ended June 20, a gain of 240 bbl. over the preceding week. Oil companies loaded approximately 5,122,320 bbl. of petroleum for eastern shipment during the week in 24,392 tank cars. The East Coast rail traffic in petroleum is estimated to be requiring a total of about 56,000 tank cars, including those en route back to loading points.

The emergency freight rates for overland shipment of petroleum were scheduled to have expired June 30. The continuance for another 4-month period was authorized by the Interstate Commerce Commission.

REPRESENTATIVE EMERGENCY FREIGHT RATES TO EAST COAST REFINERY DESTINATIONS

From Tulsa (Group 3)

	Gasoline, kerosene per gal.	Distillate fuel oil per gal.	Gas oil and/or residual per bbl.
Baltimore	$.04158	$.02700	$1.55400
New York	.04290	.03848	1.61616
Boston	.04488	.03996	1.67832
Philadelphia	.04158	.03700	1.55400
From East Texas and Texas Gulf			
Baltimore	.04290	.03848	1.61616
New York	.04422	.03922	1.64724
Boston	.04554	.04144	1.74048
Philadelphia	.04356	.03848	1.61616
From Wood River, Ill. (St. Louis)			
Baltimore	.02640	.02590	1.08780
New York	.02838	.02812	1.18104
Boston	.03102	.02960	1.24320
Philadelphia	.02772	.02738	1.14996
From East Chicago-Whiting, Ind.			
Baltimore	.02442	.02368	.99456
New York	.02640	.02516	1.05672
Boston	.02640	.02590	1.08780
Philadelphia	.02508	.02516	1.05672

Connally "Hot" Oil Law Made Permanent Federal Statute

WASHINGTON, D. C.—The Connally "hot" oil law became a permanent addition to federal statutes last week when President Roosevelt signed the bill previously passed by the House and Senate.

The bill was originally passed in 1935 as a temporary measure to backstop state proration regulations by making the interstate movement of petroleum produced in excess of allowables a criminal offense. Certain producers, particularly in East Texas, had successfully evaded the Texas conservation laws and orders by directing excessive production into interstate commerce where state authorities were powerless to interfere.

Increase of 200,000 Bbl. in Eastern Deliveries Demanded

WASHINGTON, D. C.— Immediate steps to move at least 200,000 bbl. of petroleum products per day into the Atlantic seaboard area were demanded of federal officials June 26 by a conference of eastern mayors headed by Fiorello H. LaGuardia of New York City.

They asked that arrangements be made for larger tanker shipments via the Great Lakes to Buffalo for eastward movement through the New York Canal and by reversal of the Sun and Keystone pipe lines, and, if necessary, temporary rationing of gasoline and fuel oil in District 2 to permit the desired shipments from that area to District 1. The committee also decided to press for early enactment of the Connally-Steagall bill to create the War Petroleum Corp.

The committee of mayors met with officials of the Office of Petroleum Coordinator, Office of Price Administration, and Office of Defense Transportation, all of whom promised to assist in the program but expressed doubts that it could all be achieved or would result in as great an increase in shipments as desired.

Critical Situation Faced

Mayor LaGuardia declared that the East faces a critical situation this winter unless more fuel oil is provided for heating homes and operating war industries, and he criticized federal agencies for what he termed delays and jurisdictional disputes. He demanded immediate action to increase shipments during the summer months in order to build up stocks before winter. He ridiculed estimates of possible savings by converting fuel-oil burners to coal, saying that the limit of possible conversions has about been reached.

The demands of the mayors were based chiefly on a report prepared by Walter P. Hedden, chief of the bureau of commerce of the Port of New York Authority. This report stated, in part:

"In the coming winter of 1942-1943 the Atlantic states will be short 35,000,000 bbl. of oil, 14 per cent of the 250,000,000 bbl. minimum requirement for essential war production and civilian needs. The present movement of 1,000,000 bbl. per day must be stepped up by at least 200,000 bbl. immediately to avert this shortage.

"There is no possible way of moving this added oil from Texas-Gulf fields this year by any means of transport which can be made available, as long as ocean tankers are kept off the coastal route by the Axis submarines. No pipe lines or rail tank cars can handle this additional 200,000 bbl. per day from Texas to the East Coast this year. To count on resumption of ocean tanker movement is a desperate gamble.

"The situation requires immediate tapping of supplies from District 2 for an additional 200,000 bbl. per day over and above the amounts already ordered east from this area.

"This added 200,000 bbl. can be moved from the Great Lakes area by sending an additional 100,000 bbl. per day through existing tank ship and barge facilities on the continuous inland waterway route from the Great Lakes to the East Coast via the New York Canal; by reversing additional pipe lines from water terminals at Buffalo, Rochester and Syracuse to Philadelphia which formerly carried gasoline west; by speeding up rail tank-car movement through cutting haul mileage in half.

"The outstanding obstacle to this program is not any transport equipment shortage but the present system of price differentials which can be rectified at once. Price ceilings and allowable recovery of excess transport cost from the pool created by the oil industry with government approval penalizes this movement today. (Since Mr. Hedden's report was filed, OPA has permitted an advance of 2.5 cents per gallon on gasoline and 0.5 cent on light fuel oils in the East.)

"Prices at Great Lakes ports and refineries (which include nonrecoverable pipe-line charges) exceed the ceiling prices in District 1. The present pool arrangement for allowing recovery of excess cost of long hauls from Texas by tank car without adequate provision for compensating excess pipe-line costs to Great Lakes is a bar to the only feasible method of securing the required oil. Furthermore, the pool from which excess costs are supposed to be compensated is exhausted by the heavy claims for long-haul rail movements and the dwindling nonexcess ocean-tanker hauls. Price ceilings in all consuming sections should be adjusted to replenish the pool.

"The diversion of added supplies from District 2 may require moderate and perhaps temporary control of sales in that territory by rationing until the new pipe line from Texas to Illinois is completed."

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Heroy Named Director of Reserves Of OPC, Succeeding DeGolyer

WASHINGTON, D. C.—William Bayard Heroy, president of Pilgrim Exploration Co., Houston, Tex., has been named director of reserves of the

W. B. HEROY

Office of Petroleum Coordinator. He takes over the duties formerly performed by E. L. DeGolyer under the title of director of conservation.

Mr. Heroy graduated from University of Syracuse in 1909 and spent 10 years with the U. S. Geological Survey. In 1913 he was detailed to the Department of Justice to assist in the Elk Hills litigation, and later to the U. S. Fuel Administration during the war. In 1919 he joined Sinclair Consolidated Co., and became chief geologist and manager of the exploration department, leaving in 1938 to go with Pilgrim. He is a member of the A.P.I. Committee on Petroleum Reserves, past president of American Association of Petroleum Geologists, director of American Institute of Mining Engineers, fellow of the Geological Society of America, and president elect of Society of Economic Geologists.

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Demand for Heavier Lube Oils Aids Pennsylvania Refiners

(Continued from Page 15)

and 77,900 bbl. in March. Thus production is still far short of demand despite the action of the OPA taken 2 months ago when it reinstated a 25-cent advance that had been rescinded last August.

The current rate of drilling in the Pennsylvania fields is ample evidence in itself that the rescinding of the 25-cent increase in August 1941, was unfortunate. Well completions in the Bradford field, source of approximately 55 per cent of Pennsylvania Grade crude oil, totaled 301 in May. This was well above the April total of 280 completions but at the same time was short of the total for May 1941, when 316 wells were completed. Drilling is correspondingly slow in other Pennsylvania fields though a large number of rigs are reported to be in operation in West Virginia where the majority of wells are in gas areas. The rescinding of the August 1941 price advance was followed immediately by a slump in drilling operations which it is believed would not have occurred had the increase been allowed to stand. Had the drilling rate of last spring and early summer been continued, the Pennsylvania fields would have been in a better position to meet today's demands.

As an incentive for increased production, the OPA promised to allow another 25-cent increase when Pennsylvania production reached and was maintained at 85,000 bbl. per day for a period of 3 months. In view of the indicated decline in May, it is regarded as highly improbable that that figure will be reached and maintained for the required period this year. It would require an increase of almost 8 per cent from the estimated May average. While this is a comparatively small increase for a flush field, it is a considerable one for an area where an increase in production is dependent on the rate of drilling and the quality of properties being developed. The present rate of drilling is insufficient apparently and there is no question that the properties now being developed, are inferior to those drilled earlier in the life of the region.

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DEATHS

ARTHUR G. WOLFE, 52, retired drilling contractor of Tulsa, died in a Coffeyville, Kans., hospital last week from injuries received in a fall from a horse. Mr. Wolfe suffered a lung injury when thrown from his horse while riding over his farm near Nowata, Okla. Until his retirement last year, Mr. Wolfe had been a partner in the Hissom & Wolfe Drilling Co.

NATHAN LYNCH, JR., 46, owner of Lynch Refining Co., Kilgore, Tex., died June 23 from natural causes. He was on a hunting trip, and had returned to his car where he was found dead by his hunting companion. He had been an operator in the East Texas field for about 10 years. His widow and two sons survive.

Patent System Defended As Spur to Technical Progress

By JOHN A. DIENNER
Brown, Jackson, Boettcher & Dienner

THE pushing of social reform in which America has been engaged has been carried to certain excesses which have tended to injure other institutions. The ship of social reform must not run too long on one track, or it will lose its way. One of the sufferers appears to be the patent system. In the guise of social reform, the usefulness of the patent system is being threatened. The patent system is a part of the economic system of capitalism and free enterprise. That it has been the basis of certain abuses in the past is not subject to question. The thing we are interested in is not the morality of certain users of the system, but rather it is to consider the utility of the system and to examine the actions of the courts and the legislators to see whether actions taken and proposed have the capabilities of improvement intended or of injury which should not be caused.

A Product of the Patent System

Mass production, which has given Americans a stream of new conveniences, constantly better and at constantly lower prices, is directly attributable to the American patent system. The first step in this direction was taken long ago, almost at the beginning of the U. S. patent system, but the full development of the system of mass production was not attained until about the beginning of the present century.

The American patent system, in counter distinction to any other in the world, makes the significant date upon which the inventor's rights depend as against a rival, that date when he actually made his invention. In all European countries the system prevails that the man who first files an application, unless it can be shown that he stole it from another secures the patent. That means that no man is safe in suggesting to another that he is working on a problem the solution of which involves the making of an invention. It means that no man is safe in revealing his invention to another until after he has filed his patent application. This compels a degree of secretiveness and suspicion of which we in America are completely free. Here in America if I wish to put into mass production so simple a thing as a new can opener, I can produce my model and then freely take it to the various suppliers of steel, of forgings, of paint, of wood for the handle, of rivets, or any other component parts, and discuss with specialists in steel, wood, forgings, rivets, etc., my particular problem, make whatever revisions are necessary and establish my machinery for production without fear of losing the right to my invention.

The American patent system carries no taxes, no workings, and it not hindered in any manner. The reward therefore to the inventor is more direct and less burdened with difficulties than the system of any other country. The patent system makes it possible for the inventor to call upon the public to contribute to the cost of his efforts in producing progress. In other words, without a patent system to make provision for the public to pay for the progress which science and the useful arts derive from inventors and discoverers, invention and discovery must be carried on at the expense of the inventors and discoverers who are in no position to carry the expense. The public itself must pay for progress, and the patent system is the method by which it is accomplished.

Difficulties of Present Situation

The patent system is an economic-social device. On the one hand, it is a method of opening up opportunity to him who will create new things, new utilities, new processes. On the other hand, it is a method of making the public pay for progress, and it is a regulator of business.

In recent years, the world has been in the throes of what we call "social reform." It appears to be an examination of conditions to see whether the distributable advantages of the world are being fairly distributed in proportion to the contribution of the respective participants in the world's work. While there has been an enormous amount of careful and critical study and examination of our economic, social, and political systems, there has been plenty of faulty thinking. People have been trapped by catch words and misled by fallacious economic theories. When the situation is analyzed, it will be seen that the present effort to produce social reform is attempting to effect two inconsistent purposes. On the one hand is the drive to provide economic security. The more highly we become organized, the more necessary is it that the individual have a continued income; separate him from the payroll and all his rights are useless.

Muddied Thinking Is Destructive

While I do not mean to say that no improvement can be made in the system of granting and enforcing and utilizing patents, and I will in fact point out certain needed changes, nevertheless, we must constantly defend the system against misconceptions and muddied thinking, as well as against the attack of actual enemies. A great difficulty which friends of the system constantly observe is the failure to understand the basis nature of a patent.

The attitude of the Supreme Court on the question of invention has undoubtedly undergone deterioration in recent years. Let me refer to the pronouncement of Chief Justice John Marshall in the famous case of Grant v. Raymond, 31 U. S., Page 218, at page 241, in an opinion in which the Supreme Court sustained the granting of a reissue patent, even though the reissue of a patent was not authorized by statute. He said:

"The public yields nothing that it has not agreed to yield; it receives all which it has contracted to receive. The full benefit of a discovery, after its enjoyment by the discoverer for 14 years (now 17 years) is preserved; and for his exclusive enjoyment of it during that time the public faith is pledged."

The Supreme Court viewed it as a solemn

Recent reflections of the administration's attitude toward the patent system have aroused new interest in the background and current functions of this integral part of the American industrial machinery. This analysis, while applicable to all branches of industry depending on technological advancement, is, none the less, pertinent to the oil business. Technical progress in the petroleum industry, particularly the refining branch, has been outstanding in recent years. Many argue that without patents the complex processes and the resultant useful products now available to all refiners would still be closely guarded secrets of a few companies fortunate enough to have employed an inventive genius or in financial position to support the vast technical staffs necessary for such development.

The author of this analysis, first presented in slightly extended form before the American Institute of Chemists, is an outstanding authority. He served as special counsel for the Department of Commerce for presenting evidence of the operation of the patent system before the Temporary National Economic Committee in 1939. He is special lecturer on foreign-patent law at John Marshall and for the past 9 years has been a member of the patent-law advisory committee appointed by the secretary of commerce.

Mr. Dienner served 4 years in the examining corps of the U. S. Patent Office and, in 1934, was appointed by the president as a delegate of the United States to the London conference, which negotiated a revision of the treaty known as the International Convention for the Protection of Industrial Property. He is vice president of the International Association for the Protection of Industrial Property, with headquarters at Berne, Switzerland, and has been president of the American group from 1935 to date. He is vice chairman of the patent section of the American Bar Association and a member of the Chicago patent law firm of Brown, Jackson, Boettcher & Dienner.

pledge by the public that the law offered the exclusive right in the invention to the inventor in return for his disclosure to the public. And to the solemn performance of this bargin, as the great chief justice said, "the public faith is pledged."

Let me next call your attention to a decision in 1923 by Chief Justice William Howard Taft, in the famous case of Eibel Process Co. v. Virginia Paper Co., 261 U. S., Page 45, at Page 63, in which the court sustained a patent on a process of making paper, in which the invention consisted merely in changing the inclination of the screen upon which the paper pulp was formed into a web. He said:

"In administering the patent law the court first looks into the art to find what the real merit of the alleged discovery or invention is and whether it has advanced the art substantially, if it has done so, then the court is liberal in its construction of the patent to secure to the inventor the reward he deserves."

Douglas' Pronouncement

From these famous pronouncements by judges of the highest legal and judicial attainments, we come to the recent pronouncement of Justice Douglas, in the case of Cuno Engineering Corp. v. The Automatic Devices Corp. (decided Nov. 10, 1941). He said:

"We may concede that the functions performed by Mead's combination were new and useful. That does not necessarily make the device patentable. Under the statute the device must not only be new and useful. It must also be an invention or discovery. . . . That is to say, the new device, however useful it may be, must reveal the flash of creative genius, not merely the skill of the calling. If it fails, it has not established its right to a private grant on the public domain."

There are two unhappy statements in that quotation: First, the concept that a patentable invention or discovery must be the result of a flash of genius; and, second, that a patent is a private grant on the public domain, namely, the franchise theory of the Department of Justice.

As to the soundness of Justice Douglas' pronouncement, we must analyze the difference between his test and the test of Chief Justices Marshall and Taft. Chief Justice Marshall said that the public faith is pledged, since *the public yields nothing*, and it receives all it has contracted to receive. The Marshall statement clearly points out that the patent is not a private grant upon the public domain, but it is a grant which takes nothing from the public, but gives the public that which it contracted to receive. Chief Justice Taft said that the true way of evaluating the patent was to see whether the invention had made substantial advance in the art. That test is the *objective* test. It is the test of whether the invention really contributed something to the art.

The Douglas test of invention is *subjective*. It tests not the invention but the inventor. You can visualize what that would mean. The defendant may well put the inventor on the stand and say: "Why, your honor, this man does not look as though he ever had a flash of genius in his life."

What has it to do with the nature of the invention whether the man arrived at the result through a "flash of genius" or through the slow plodding of endless toil and sweat? Does it make any difference whether the inventive act smells of the brimstone of the thunderbolt, or whether it smells of the lamp?

Objectives of Senate Hearing

The periodic review of the patent system by the Senate committee on patents and the House committee on patents is highly desirable, to see that the needs of the public are actually promoted and that no unfair advantage accrues under a system intended to give the benefits of progress to the public and a reward to the inventor.

Particularly in view of the mistaken notion of the Justice Department as to the character of the patent, and the corrective decision of the Supreme Court in cases where abuses has arisen, the committees of Congress have for some time in the past, and are now interested to discover uses or abuses of the patent system which are antisocial in character. The particular occasion which has called into being the recent hearings is the relaxation of the patent monopoly in the war effort. The president correctly realizes the war powers which his office carries, and has advised the public and Congress that not only would foreign patents be seized, but that rights under United States patents necessary to the war effort are also subject to seizure as is any other property. The Senate committee thereupon being relieved of the immediate necessity of legislation looking to preventing the execution of war measures by patent holders stated in the press that it would have time for a long-range revision of the patent laws. The Senate committee then proceeded to examine various phases of the patent laws, and particularly whether or not seizure of patents under certain circumstances is desirable, or the granting of compulsory licenses is desirable, or whether antitrust measures should be written into the patent laws, etc. The hearings have not been as illuminating or constructive as they have been sensational.

Normal Contracts in Good Faith

In its search to discover antisocial uses of patents or the exercise of patent rights in an antisocial manner, the Standard Oil Co. (New Jersey), in respect to rubber manufacture, and the General Electric Co., in respect to Carboloy manufacture, have been held to public scorn for having entered into agreements with German companies in respect to interchange of patent rights.

It is my information that these contracts were made in peacetime and were normal contracts made in good faith. With the advent of war, there was unfortunately no power on the part of the contracting parties to void or dissolve the contracts. While the state of war made it impossible, and in fact illegal to communicate with the other parties, nevertheless the contract presumably remains in force, and becomes effective again in peacetime. The Senate might well relieve the situation by permitting such a contract to be unilaterally canceled in the event of war or national emergency.

However, there was revealed a thought which is new and that is, that a company such as Standard Oil Co. or General Electric or any other company or individual which, by its own voluntary agreement renounces the development in the United States of any commodity, facility or process which is or is likely to be of service to the people of the United States in wartime, is derelict in its duty to the public.

The principle presupposes an obligation upon the private corporation, for such Standard Oil Co. and General Electric Co. still are, as well as upon the individual, to safeguard the interest of the people at large by not disabling itself in respect of the production of any commodity or the performance of any process which is or may be of general utility to the nation in times of war or public danger.

The senate committee has, in introducing S-2491, rehashed some of the concepts of the monopoly committee (TNEC), which in my judgment were repudiated by the Congress, by the public, and by the patent bar at the close of the hearings.

It is my conviction that the Department of Justice has made these recommendations based upon misinformation as to the nature of the patent grant, just as I believe Justice Douglas was misinformed in designating patentable inventions solely as the product of a flash of genius, and in considering a patent as "a private grant upon the public domain."

S-2438 is thoroughly bad. It is a corporation licensing bill and provides severe penalties for any wrongful use of a patent, and also proposes to eliminate any restrictions in licenses to be granted under patents. It also fails to meet any need or to solve any problem which would advance the usefulness of the patent system, or outlaw any present abuse which the courts do not now have power to stop.

Subject to Public Convenience

All proposals to grant compulsory licenses heretofore have rested upon the proposition that where a man refuses to manufacture something under his patent, or does not manufacture enough to satisfy the public, a rival may step in and demand that he be permitted to share the market by working under the patent.

It is remarkable that no testimony establishing any such situation has been brought to the attention of Congress, nor was it brought to the attention of the monopoly committee. The fact is, such a situation is largely self-corrective.

A much more important concept is that which would permit the U. S. Government to exercise the right of eminent domain over a patent in any one of the following three instances: (1) in the case of any patent covering devices required in time of war or national danger; (2) any patent covering devices intended for national defense; (3) any patent covering devices charged with a genuine public interest. In brief, if we stick to the proposition that when an invention or the product thereof is charged with a public interest, it may, upon a proper showing, be condemned, or the use thereof condemned, for the benefit of the public, or a public convenience and necessity. We can follow rules of law long established for property in general.

In regard to the abuses of patents in restraint or trade or tying-in clauses or the like, the Sherman Act and the Clayton Act, and the decisions of the Supreme Court, are a satisfactory guide for antitrust action. After all, the patent is an innocent and harmless device in itself, and the mere misuse of it or the use of it to commit an unlawful act in no way contaminates the patent nor contaminates the system under which it was granted. If any antitrust legislation is necessary, it should rest upon its own merit, and not consist in the destruction of a segment of the patent system.

The Supreme Court has laid down clear lines as to what constitutes the abuse of patents, as in taking the royalty on something outside the monopoly of the patent, or in controlling unpatentable materials, supplies, etc. The principles covered by these Supreme Court decisions are clear and leave no one in doubt. Legislation in this direction is not necessary. No need for the same has been made out at the hearings, nor at any hearings with which I am familiar.

The American patent system has served us well. It is fundamentally sound, and it is far superior to the patent system of any other country. If any change requires to be made in it, it should be made in accordance with the American tradition, and with the sole purpose in mind of seeing whether such change will make it a better and more useful instrument in promoting progress of science and the useful arts. This is the true test. Any proposed change which does not meet the test should be decisively rejected.

Natural Gasoline

Butane-Propane Production Declines Sharply Along With Natural Gasoline in Texas Plants

AUSTIN, Tex.—Production of natural gasoline and liquefied petroleum gases in Texas declined to 2,472,120 gal. daily (58,860 bbl.) during April, a reduction of nearly 20 per cent from the year's high peak of 3,034,759 gal., registered in February. The reduction of 562,639 gal. in production of liquid products by natural-gasoline manufacturers in Texas between February and April came in two nearly equal declines. Production dropped 275,956 gal. daily in March and another 286,683 gal. per day in April.

The decline in gasoline-plant intake has not been quite as severe as the production slump. The 149 natural-gasoline plants reported in Texas Railroad Commission statistics received 2,446,240,000 cu. ft. of gas daily during April, approximately 15 per cent less than intake of 2,813,500,000 cu. ft. daily in February.

Natural-gasoline plants produced 502,916 gal. of butane daily in April, nearly 35 per cent under the output of 766,822 gal. daily in February. The decline in natural-gasoline production was more moderate, falling less than 10 per cent from a daily average of 2,267,937 gal. daily in February to 1,969,204 gal. in April.

Details for the first 4 months of natural-gasoline plant operations in Texas are shown in the accompanying table.

TEXAS NATURAL-GASOLINE OPERATING SUMMARY

	January	February	March	April
Intake (thous. cu. ft. daily):				
Casinghead gas	1,090,086	1,099,527	1,009,708	880,365
Dry sweet gas	1,035,946	1,062,918	981,035	921,949
Dry sour gas	660,996	634,718	633,450	626,117
Refinery vapors	14,274	16,337	13,773	17,809
Total gas	2,801,302	2,813,500	2,637,966	2,446,240
Residue disposition (thous. cu. ft. daily):				
Extraction loss	156,913	164,119	150,555	127,948
Returned to leases	205,547	201,855	186,304	158,825
Plant use	199,023	199,506	192,311	185,129
Repressuring	205,975	201,976	198,059	188,882
Carbon black	899,030	894,732	882,206	836,230
Pipe lines	873,622	871,961	801,612	769,393
Gas lift	12,080	13,885	9,787	5,514
Vented	250,012	265,466	217,132	174,319
Total	2,801,302	2,813,500	2,637,966	2,446,240
Plant production (gallons daily):				
Natural gasoline	2,205,772	2,267,937	2,134,985	1,969,204
Gallons per 1,000 cu. ft.	.787	.806	.809	.805
Butane-propane	767,070	766,822	623,818	502,916
Total products	2,902,842	3,034,759	2,758,803	2,472,120

Recycling News

South Jennings Field Plant Dedicated by Stanolind

NEW ORLEANS, La.—Stanolind Oil & Gas Co.'s new recycling plant in the South Jennings field, Jefferson Davis Parish, Louisiana, was dedicated June 27 at ceremonies participated in by state and company officials. The plant is the second largest gas-cycling operation in the state, being surpassed only by Cotton Valley.

The plant will handle 50,000,000 cu. ft. of gas daily, recovering the condensate and returning the dry gas to the producing reservoir for pressure maintenance. The South Jennings field produces from depths ranging from 8,600 to 9,500 ft.

Louisiana Project Reviewed By Commissioner McHugh

ABBEVILLE, La.—Plans for construction of a condensate-recovery plant capable of processing 200,000,000 cu. ft. daily in the Erath field, Vermilion Parish, Louisiana, were outlined here last week by operators at a public hearing before Joseph L. McHugh, conservation commissioner.

The interested companies propose to drill 18 additional wells in the field if the program is approved. The field now contains 11 wells.

Natural Gas

Honoria B. Moomaw Made Secretary of Gas Section

NEW YORK.—Honoria B. Moomaw has been appointed acting secretary of the Natural Gas Section of the American Gas Association, effective June 15. On that date E. Holley Poe, secretary of the section, resigned to become director of the Natural Gas and Natural Gasoline Division of the Office of Petroleum Coordinator for War.

HONORIA B. MOOMAW

Miss Moomaw is a graduate of Randolph-Macon Woman's College, Lynchburg, Va., majoring in English. Her business experience includes retail and wholesale selling and sales promotion; several years as a medical secretary, and since 1939 secretary to Mr. Poe.

Annual meeting, board of directors, California Natural Gasoline Association, Los Angeles, June 9, 1942. Left to right around outside of tables: J. C. Gilbert, Barnsdall Oil Co.; John Rogers, Cooper-Bessemer Co.; W. D. Smith, Wilshire Oil Co.; Ben C. Dumm, Allied Supply Co., chairman entertainment committee; John H. Kunkel, Fluor Corp., Ltd., chairman publicity committee; W. W. Robinson, Jr., Texas Co., incoming president; W. C. Dayhuff, Standard Oil Co. of California, outgoing president; George L. Tyler, secretary, C.N.G.A.; J. B. Taylor, Signal Oil & Gas Co., chairman, technical committee; George C. McLaren, Standard Oil Co. of California; J. S. Fluor, Jr., Fluor Corp., Ltd.; J. C. Burks, O. C. Field Gasoline Corp.; N. H. Mull, Texas Co.; William Moeller, Jr., Southern California Gas Co. Left to right around inside of tables: P. S. Magruder, General Petroleum Corp.; H. E. Moulton, Chanslor-Canfield Midway Oil Co.; A. H. Bell, Continental Oil Co.; C. D. Gard, Union Oil Co. of California; Randal Maass, General Petroleum Corp., chairman, program committee; D. E. McFaddin, Union Oil Co. of California, chairman, fall meeting committee; Harry Fiske, Ingersoll-Rand Co.; M. L. Fort, Pacific Lighting Corp.

ENGINEERING *and Operating* SECTION

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Torque Converters Applied to Drilling and Servicing Rigs

By T. P. SANDERS

An increased engine life can be insured by installing a suitable coupling, such as a torque converter, between the output shaft and the driven machinery. Use of torque converters on drilling and servicing rigs is described in this article.

NECESSITY of prolonging the lives of engines, which are now one of the the most sought-after items of the war-production program, is attracting more and more attention to the torque converter. A new rig recently placed in service utilizes torque converters in a manner never before attempted in rig design, and is believed to indicate a trend in torque-converter application.

In the first applications of the torque converter to drilling rigs, the draw works drives were designed so that the torque converter was to serve as an hydraulic transmission. Save for a high and low speed on the hoist drum, all speed adjustment was accomplished at the converter While these applications were successful according to all standards, a fault existed in the fact that the torque converter, acting over such wide speed and load ranges, was called on much of the time to operate at unfavorable points on its efficiency curve. By providing four speeds forward, the new rig makes it possible for the converter to act under speed and load conditions falling within the flat portion of its efficiency curve where average efficiency ranges from 75 to 85 per cent.

If a mechanical transmission alone is used on the draw-works drive of a rig powered by internal-combustion engines, all of the power available from the engines is utilized only for a few short periods during the removal of the drill pipe from the hole. The effect is illustrated graphically in the accompanying chart, Fig. 1. This power chart is for a six-speed rig powered with internal-combustion engines capable of delivering 340 hp. when loaded to capacity. A long, heavy string of drill pipe is being pulled from the hole, and it is necessary to use the lowest drum speed on the rig to start the trip. Since the governors hold the engines to a constant maximum speed, the speed of hoisting must remain constant until the load has lightened enough so that the driller can shift into a higher drum speed. During the period of hoisting in any one drum speed the load being lifted gradually decreases as each stand of drill pipe is removed; but since there is no appreciable increase in hoisting speed, it is apparent that the power delivery from the engines becomes increasingly smaller. In the example chosen for illustration the power delivery drops to 204 hp. before the load becomes light enough to be handled with the next-to-lowest drum speed. At several points during the hoisting, in fact, the power delivery closely approaches the 200-hp. curve, although the engines are capable of delivering 340 hp.

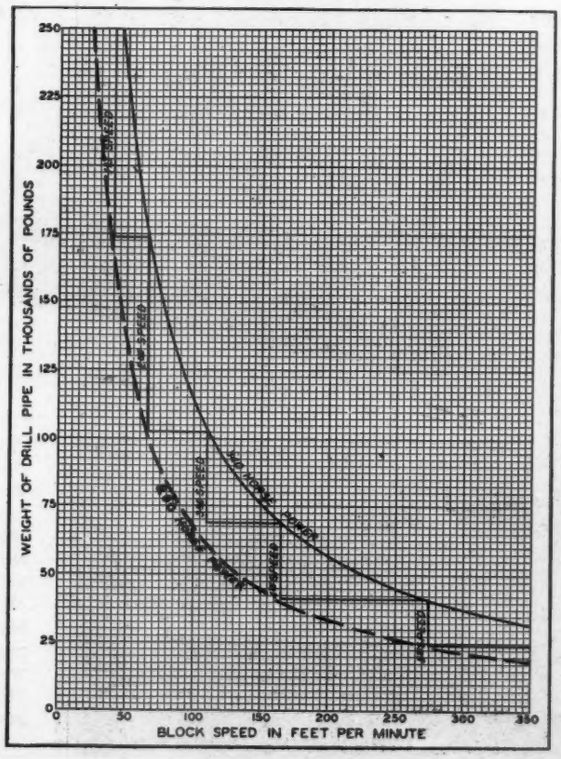


Fig. 1—During the hoisting of a long string of pipe with a mechanical drive, the full power capacity of the engines is utilized for only a few short periods, as shown in the chart at left

In the above example the theoretical power delivery during hoisting is considered. In actual field practice the result is less satisfactory. The driller, constantly attempting to offset this rigid engineering concept, usually changes his speed ratio just as soon as the engine load becomes light. In this way he greatly overloads the engines in the higher speed ratio. Due to drop in engine speed, this overloading gains nothing in horsepower delivery; but since it causes the engines to labor at the reduced speeds it gives the driller the illusion of getting all available power from the machine. Naturally it imposes terrific abuse on the engines, and may send the mean effective pressure up to 110 lb. on machines where the recommended maximum mean effective pressure is only 70 lb.

It is overcoming this engine abuse that

HOISTING-TIME RECORD

No. 90-ft. stands of 4½-in. pipe	Depth (ft.)	Time required for hoisting one 90-ft. stand, seconds	Draw works speed
63	5,670	83	Lo-Lo
62	5,580	82	"
61	5,490	81	"
60	5,400	75	"
59	5,310	77	"
58	5,220	77	"
57	5,130	77	"
56	5,040	74	"
55	4,950	68	"
54	4,860	68	"
53	4,770	66	"
52	4,680	64	"
51	4,590	64	"
50	4,500	63	"
49	4,410	60	"
48	4,320	58	Lo-Hi
47	4,230	58	"
46	4,140	55	"
45	4,050	56	"
44	3,960	55	"
43	3,870	55	"
42	3,780	52	"
41	3,690	51	"
40	3,600	50	"
39	3,510	49	"
38	3,420	49	"
37	3,330	48	"
36	3,240	55	Hi-Lo
35	3,150	54	"
34	3,060	52	"
33	2,970	51	"
32	2,880	50	"
31	2,790	50	"
30	2,700	48	"
29	2,610	45	"
28	2,520	44	"
27	2,430	42	"
26	2,340	42	"
25	2,250	41	Hi-Lo
24	2,160	38	Hi-Hi
23	2,070	37	"
22	1,980	35	"
21	1,890	35	"
20	1,800	34	"
19	1,710	36	"
18	1,620	33	"
17	1,530	33	"
16	1,440	31	"
15	1,350	30	"
14	1,260	31	"
13	1,170	30	"
12	1,080	28	"
11	990	28	"
10	900	27	"
9	810	27	"
8	720	28	"
7	630	27	"
6	540	26	"
5	450	26	"
4	360	25	"
3	270	25	"
2	180	24	"
1	90	24	"

the torque converter fills a most essential need today. It permits the engines to run at a constant speed regardless of the speed of the hoist drum, and even if such an overload is imposed that the drum shaft will be stalled completely, the engines will continue to run at constant speed, indicating that they have not been subjected to overload. By guarding engines against destructive overloading, shock loads, and torsional vibration, the torque converter may prove capable of nearly doubling the life of the typical drilling engine.

Considering the chart, Fig. 1, again; let us assume that the same engines had hoisted the same string of pipe, but this time using torque converters with the proper speed-ratio selections in the drive. The effect would be that the power delivery at the engines would be the full 340 hp. throughout the hoisting operations. For as the drill-pipe load grew lighter in each successive draw-works speed ratio, the speed of hoisting would have increased accordingly. In this way the entire engine capacity would be utilized with the hoisting of each stand of pipe. There would, of course, be the 15 to 25 per cent power loss at the torque converters to be taken into account, but the converters would have compensated for this loss by permitting the engines to operate at their most efficient speed.

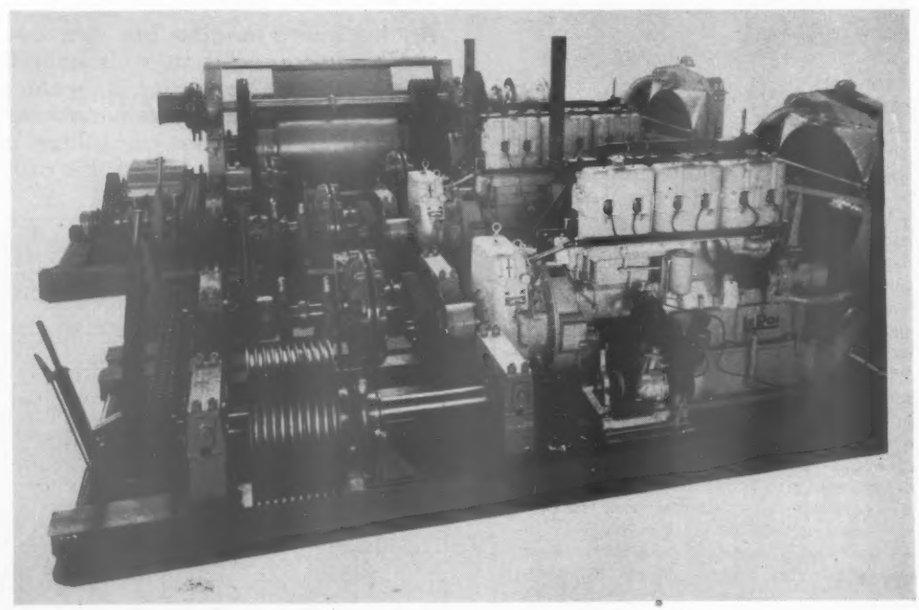
The table is a hoisting-time record showing the effect of pulling a string of drill pipe with engines employing torque converters. It will be noted that the hoisting speed rapidly increased as the string became shorter, and a point was never reached where hoisting speed became a constant because of the governed maximum engine speed.

In pulling a heavy string of drill pipe the driller is ordinarily called on to be an expert judge of loads so that he can shift draw-works speeds at the proper times. If he shifts too soon he may have to return to the lower speed, thereby consuming additional time. The torque converter serves to adjust when a higher speed is used too soon, making it unnecessary to return to the lower speed, while at the same time guarding the engines against the overload. In the pulling-time record shown above it can be seen that the second change of speeds took place too soon. However, the only detrimental result was that the hoisting speed was reduced for six stands.

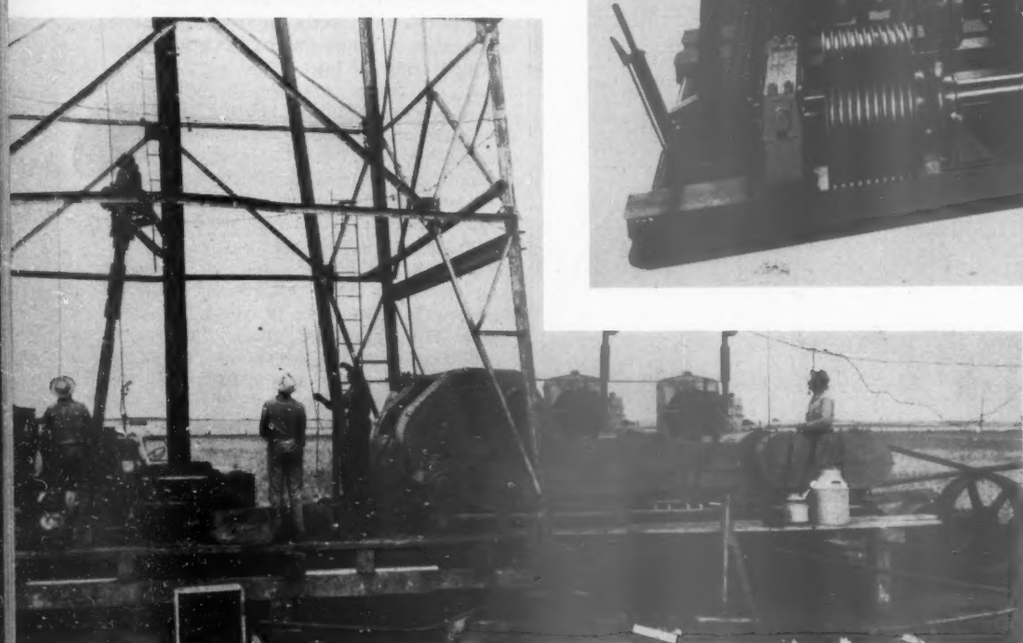
Converter on Each Engine

In addition to the feature of using torque converters with a four-speed transmission, the new rig introduces another innovation in torque-converter application. Ordinarily, when two or more internal-combustion engines are compounded it is extremely difficult to synchronize the machines so that each will carry its share of the load at all times. Small differences in the timing, the extent of wear, the condition of the intake and exhaust passages, or small cyclic variations will cause two engines to oppose one another to some degree. The use of a torque converter on each engine of the new rig serves to give the same general performance that would be obtained by compounding two electric motors. The converters are mounted on what would normally be the clutch housings of the two engines, and the output shafts of the converters are compounded, each shaft being provided with a friction clutch.

In the past it has been generally supposed that it would be impractical to drive the slush pump through torque converters. Analysis of the factors involved led to a new appraisal of this possibility.



These photographs show the new type rotary rig that uses torque converters on both engines, thereby making the hydraulic drive effective on all services



Chief objection to torque conversion on a slush-pump drive had been centered around the fact that it would make possible the multiplication of torque to an extent where it might greatly exceed the safe gear load of the pump. Upon consideration it was realized that the relief valve on a pump discharge is just as reliable in eliminating excessive pressures as are the relief valves on boilers, which have been generally accepted as possessing satisfactory safety standards. Also, it was found that experienced drilling men often used engines rated 50 per cent higher in horsepower capacity than the pumps which they drive.

(Continued on Page 32)

Calculation of Load and Stroke In Oil-Well Pump Rods (Part 1)

By B. F. LANGER and E. H. LAMBERGER
Westinghouse Research Laboratories

Sucker rods used in oil wells can have a prolonged lift if they are operated in a manner which will prevent shocks and overloading. This article, will will appear in two installments, deals with formulas recently developed for the determination of these factors.

The sucker-rod pump as used in oil wells is treated as a problem in longitudinal vibration of bars. Solutions are obtained for the forces and motions at both ends of the rod string, thus giving formulas for the calculation of polished-rod load and plunger travel. The results of the calculations are compared with test results.

This paper was delivered before the national meeting of the applied mechanics division of the American Society of Mechanical Engineers, Cambridge, Mass., June 19-20. A discussion of the technique used in making the tests appeared in the May 7, 1942, issue of The Oil and Gas Journal.

IN order to make safe and economical applications of oil-well pumping equipment it is necessary to be able to predict with reasonable accuracy the force that will be required to move the sucker rod up and down and the amplitude of the plunger displacement at the pump. The formula for peak force at the polished rod which is now in common use is that recommended by the American Petroleum Institute (A.P.I.),* which is

$$\text{PPRL} = (W_R + W_o)\left[\frac{1 + SN}{5{,}400}\right]$$

where

PPRL = peak polished-rod load, lb.
W_R = weight of rod string, lb.
W_o = weight of fluid = $0.34D^2L$
D = effective diameter of plunger, in.
S = length of polished-rod stroke, in.
L = depth of pump, ft.
N = strokes per minute

An improved formula has been suggested by Kenneth N. Mills.† Its advantage over the A.P.I. formula is that it brings in dynamic effects as the square instead of the first power of the speed, which is more nearly the case; it is

$$\text{PPRL} = W_o + W_R\left(1 + \frac{SN^2}{70{,}500}\right)$$

The symbols are the same as in the A.P.I. formula.

Both formulas were designed to be simple in application and to represent the average of a large variety of pumping conditions. Since they take no account of such important factors as fluid level and the natural frequency of the rod string they must be expected to be seriously in error when used for the more severe pumping conditions.

Theoretical approaches to the problem have been made by E. Kemler* and R. W. Rieniets.† Kemler set up the differential equations for the subsurface equipment (rods, tubing, and fluid) and used an electrical model to solve typical problems. Rieniets attempted to calculate the plunger travel by considering the sucker rod as a system with one degree of freedom.

In the present paper the authors consider the sucker-rod pump as a problem in the longitudinal vibration of bars. The fluid load is considered as a constant force suddenly applied to the plunger at the bottom of the stroke and suddenly removed at the top, plus the additional force during the upstroke required to accelerate the fluid column. The justification for this method of analysis was found in the results of actual tests. In these tests, the effect was found of changing the important variables of a well one at a time, so that the effect of each variable could be studied by itself. Simultaneous records were obtained from magnetic strain gages located in the string of rods at the bottom, center, and top, as well as various points on the surface equipment, as shown in Fig. 1. Such records were not available to any previous investigators.

Development of Formulas

Forced vibrations of rods.—The first problem to be solved is that of a long rod immersed vertically in a viscous fluid, with the top end of the rod constrained to move up and down with an harmonic motion. For the present we shall consider no forces acting on the bottom of the rod.

Let x = distance of a point from top of rod
u = vertical displacement of any point from its neutral position
ϵ = unit elongation of rod material
A = area of rod cross-section
E = Young's modulus of rod material
δ = weight of rod per unit volume
P = force in rod
c = damping constant, force per unit length of rod per unit velocity through fluid
L = length of rod
S = polished-rod length
S_P = plunger stroke
ω = angular velocity of crank, radians per second
t = time
g = acceleration of gravity

*"A.P.I. Specifications for Rating of Pumping Machines," A.P.I. Standards 11-E, 4th ed., Aug. 1941.
†"Factors Influencing Well Loads Combined in a New Formula," by K. N. Mills, Petroleum Engineer, Vol. 10, Apr. 1939, pp. 27-28.

*"An Investigation of Experimental Methods of Determining Sucker Rod Loads," by Emory Kemler, A.I.M.&M. Trans., Vol. 118, 1936, pp. 89-99.
†"Plunger Travel of Oil Well Pumps," by R. W. Rieniets, A.P.I. Drilling and Production Practice, 1937, pp. 159-78.

NOMENCLATURE

The following nomenclature* is used in this paper:

A or A_R = area of rod cross-section
$A_{1,2,3}$ = area of rod cross-sections in stepped strings
A_o = area of fluid cross-section = net area of plunger
A_T = area of cross-section of tubing wall
a = velocity of sound in rod
a_o = velocity of sound in fluid
b = subscript referring to buoyant force
$C_{1,2,\ldots,8}$ = constants of integration
c = a damping constant = force per unit length of rod per unit velocity
D = effective diameter of plunger
E = Young's modulus of rod material
E_o = Young's modulus of fluid column
EPS = effective plunger stroke
e = base of natural logarithms
g = acceleration of gravity
K_1 = factor for calculating rod acceleration force (refer to Equations 3 and 3a)
K_2 = factor for calculating damping factor (refer to Equation 8)
L = total length of rod string
$L_{1,2,3}$ = lengths of rod sections in stepped strings
N = strokes per second
n = damping constant = $\dfrac{gc}{2A\delta}$
P = force in rod
PPRL = peak force at polished rod
P_U = static polished-rod load during upstroke
P_D = static polished-rod load during downstroke
P_P = force at plunger
p = 2π times undamped natural frequency of rods
p_1 = 2π times damped natural frequency of rods
R = factor for calculating plunger travel (refer to Equation 2)
R_1 = a symbol (refer to Equation 3)
r = ratio between pumping frequency N and undamped natural frequency of rods
S = polished-rod stroke
S_P = plunger stroke
s = number of a term in an infinite series
t = time
u = vertical displacement of a point from its neutral position
u_L = one-half of plunger stroke
W_o = weight of full height of fluid column on net area of plunger
W_R = weight of rod string
W_{oD} = differential fluid load = change in plunger force at end of stroke = load due to net fluid head on full area of plunger
W_{o1} = weight of fluid above casing fluid level on net plunger area
W_{o2} = weight of fluid below casing fluid level on net plunger area
W_{R1} = weight of rods above casing fluid level
W_{R2} = weight of rods below casing fluid level
W_{R1b} = buoyant force on rods above casing fluid level
W_{R2b} = buoyant force on rods below casing fluid level
x = distance of a bar cross-section from the end
α = a symbol (refer to Equation 2)
β = a symbol (refer to Equation 2)
γ = a damping constant = $\dfrac{4nL}{\pi a}$
δ = weight of rod material per unit volume
δ_e = effective density of rod material = δ corrected for weight of couplings, etc.
δ_o = weight of fluid per unit volume
ϕ = phase angle of plunger relative to polished rod
ϕ_1 = phase angle (refer to Equation 3)
ϵ = unit elongation of rod material
ω = angular velocity of crank, radians per sec

*All dimensions are in inches, pounds, and seconds, except where otherwise noted.

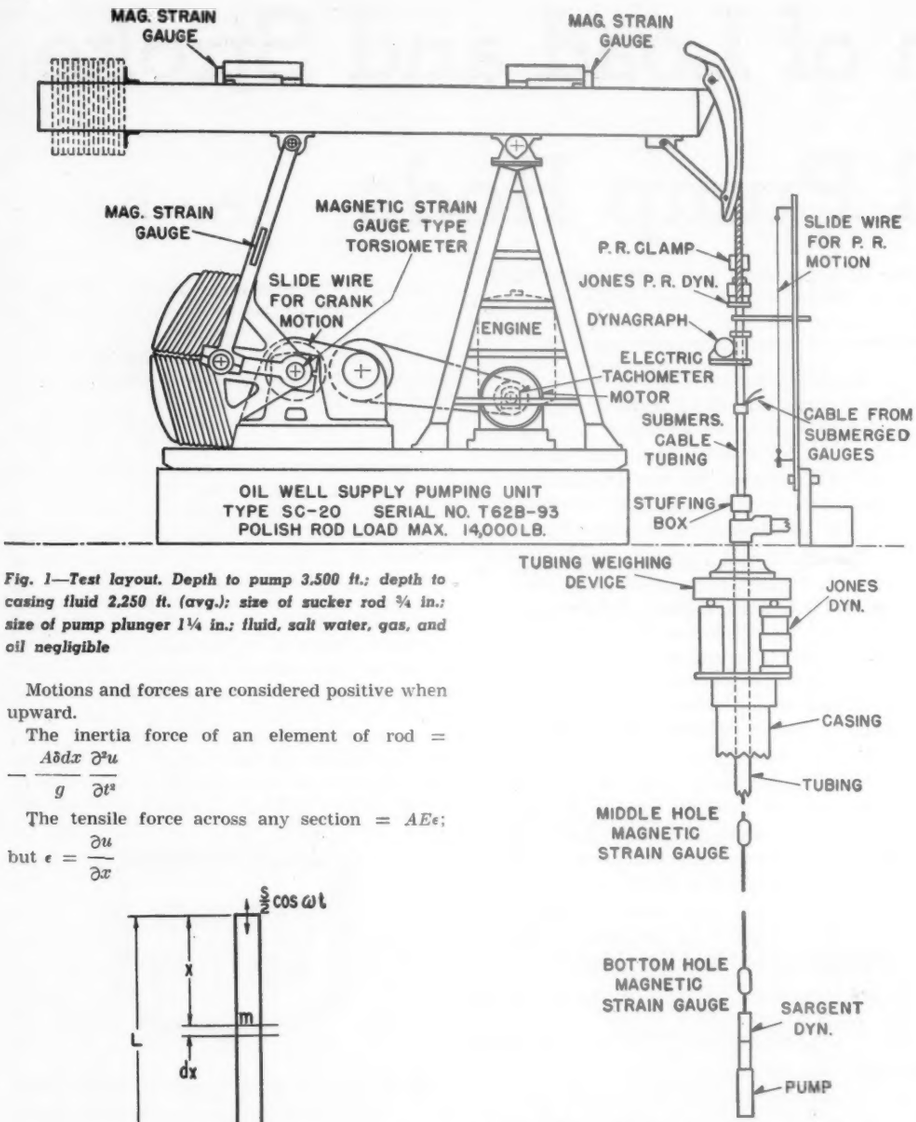


Fig. 1—Test layout. Depth to pump 3,500 ft.; depth to casing fluid 2,250 ft. (avg.); size of sucker rod ¾ in.; size of pump plunger 1¼ in.; fluid, salt water, gas, and oil negligible

Motions and forces are considered positive when upward.

The inertia force of an element of rod $= -\frac{A\delta dx}{g}\frac{\partial^2 u}{\partial t^2}$

The tensile force across any section $= AE\epsilon$; but $\epsilon = \frac{\partial u}{\partial x}$

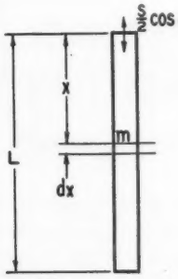


Fig. 2—Simplified rod under forced vibration

Therefore at section m (see Fig. 2), $P = AE\frac{\partial u}{\partial x}$

The net tensile force of an element $= dP = AE\frac{\partial^2 u}{\partial x^2}dx$

The damping force on an element $= -c\frac{\partial u}{\partial t}dx$

The constant force due to the pull of gravity will be left out of the equations; it is more convenient to add it on after the solution has been completed.

The equilibrium condition for vertical forces on an element gives the equation

$$\frac{-A\delta}{g}\frac{\partial^2 u}{\partial t^2} - c\frac{\partial u}{\partial t} + AE\frac{\partial^2 u}{\partial x^2} = 0$$

This can be simplified by letting

$$a^2 = \frac{Eg}{\delta} \quad \text{and} \quad 2n = \frac{gc}{A\delta}$$

It should be noted that a is the velocity of sound in the rod. Then

$$\frac{\partial^2 u}{\partial t^2} + 2n\frac{\partial u}{\partial t} - a^2\frac{\partial^2 u}{\partial x^2} = 0 \qquad (1)$$

Equation 1 is the fundamental differential equation for the longitudinal vibration of a rod in a viscous fluid. The first problem is to find a steady-state solution of this equation for the following end conditions.

$$\text{At } x = 0,\ u = \frac{S}{2}\cos \omega t$$

$$\text{at } x = L,\ P = 0, \text{ which means that } \frac{\partial u}{\partial x} = 0$$

The method of solution is similar to that used for the forced lateral vibration of a string in a viscous medium.* It has been omitted from this paper for the sake of brevity. We are interested in the plunger stroke and the polished-rod load. The plunger stroke is u at $x = L$ and is given by the expression

$$u_L = \frac{S}{2R}\cos(\omega t - \phi) \qquad (2)$$

where

$$R = \sqrt{\frac{1}{2}(\cosh 2\beta_L + \cos 2\alpha L)}$$

$$\tan \phi = -\tanh \beta L \tan \alpha L$$

$$\alpha L = \frac{r\pi}{2\sqrt{2}}\sqrt{1 + \sqrt{1 + \frac{\gamma^2}{r^2}}}$$

$$\beta L = \frac{r\pi}{2\sqrt{2}}\sqrt{-1 + \sqrt{1 + \frac{\gamma^2}{r^2}}}$$

$$\gamma = \frac{4nL}{\pi a} \qquad (2a)$$

*"Theory of Sound," by Lord Rayleigh, Macmillan Co., New York, Vol. 1, 1894, p. 192, or later printings.

This is a damping factor.

$$r = \frac{2\omega L}{\pi a} \qquad (2b)$$

This is the ratio between the pumping frequency and the undamped natural frequency of the rod string.

Examination of Equation 2 shows that $1/R$ is a magnification factor and gives the ratio between plunger stroke and polished-rod stroke for zero fluid load. Term ϕ is a phase angle and shows how much the plunger lags behind the polished rod in phase. Fig. 3 shows $1/R$ plotted against r for different values of γ. The calculation of plunger travel for actual cases will be discussed later.

The polished-rod load for zero fluid load is the static weight of the rods plus P at $x = 0$.

At $x = 0$

$$P = \frac{AESR_1\pi r}{4L}\sqrt{1 + \frac{\gamma^2}{r^2}}\cos\left(\omega t + \phi_1 + \arctan\frac{\beta}{\alpha}\right) \qquad (3)$$

where

$$R_1 = \sqrt{\frac{\cosh 2\beta L - \cos 2\alpha L}{\cosh 2\beta L + \cos 2\alpha L}}$$

and

$$\tan \phi_1 = \frac{\sinh 2\beta L}{\sin 2\alpha L}$$

Figs. 4 and 5 show the factor

$$K_1 = \frac{R_1\pi r}{2}\sqrt[4]{1 + \frac{\gamma^2}{r^2}}$$

plotted against r for different values of γ.

If we call W_R the weight of the rod string and δ_e the effective density, corrected for the weight of the couplings, guides, etc., then

$$W_R = AL\delta_e$$

and at $x = 0$

$$P_{max} = W_R\left(\frac{ES}{2L^2\delta_e}\right)K_1 \qquad (3a)$$

Effect of fluid load.—As mentioned, the fluid load will be considered as a constant force suddenly applied to the plunger at the bottom of each stroke and suddenly removed at the top, plus an additional force during the upstroke required to accelerate the fluid column. The justification for this assumption is shown in Figs. 6 and 7, which are typical oscillograms from the tests. Note the

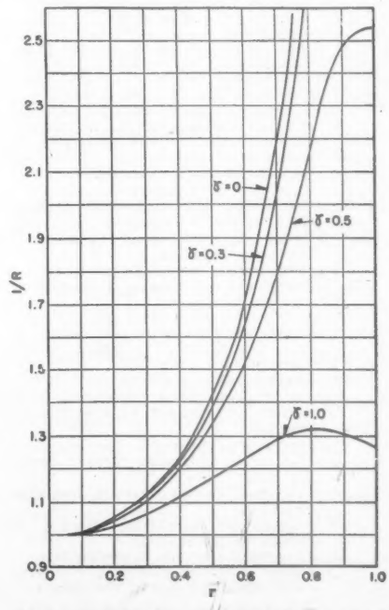


Fig. 3—Magnification factor for plunger travel

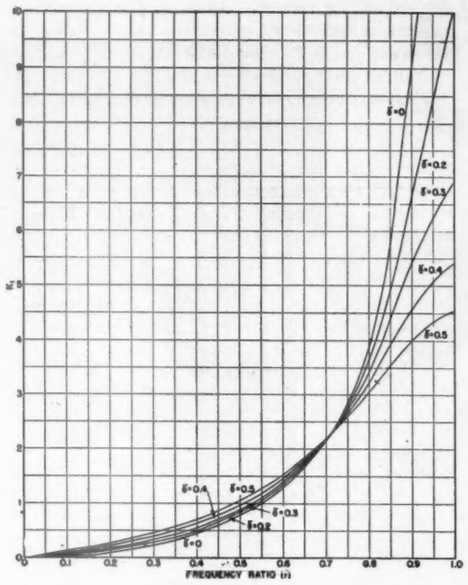


Fig. 4—Factor for calculating rod-acceleration force

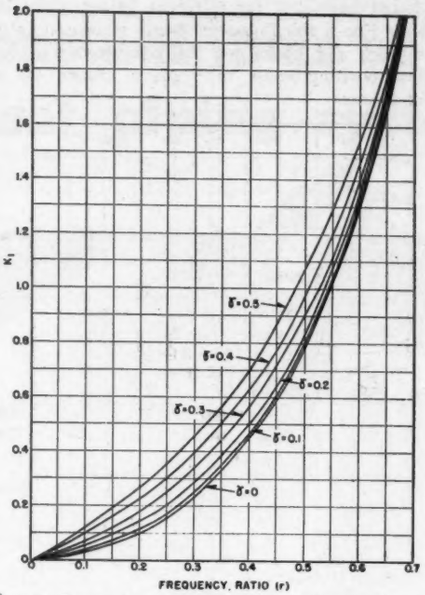


Fig. 5—Factor for calculating rod-acceleration force

rectangular nature of the stress variation at the bottom of the rod string in Fig. 6, which shows slow-speed operation. From Fig. 7 which shows faster operation, it is apparent that the acceleration force becomes appreciable at the higher speeds.

Thus, we see that the effect of the fluid must be separated into two parts, (1) that due to the "differential fluid load," W_{oD}, which is shifted from the tubing to the plunger when the standing valve opens and the traveling valve closes at the start of the upstroke, and (2) that due to accelerating the fluid column.

Let us first consider the shifting of the load, condition (1). The problem is to solve for the free vibrations of a rod fixed at the top, when a constant force is suddenly applied or removed at the bottom. This free vibration will then be added to the forced vibration expressed by Equations 2 and 3.

The differential equation is the same as that for forced vibrations and is given by Equation 1.

The end conditions are

$$\text{at } x = 0,\ u = 0$$

$$\text{at } x = L,\ \frac{\partial u}{\partial x} = 0$$

Assume that at $t = 0$ the differential fluid load W_{oD} is suddenly released. (This happens at the top of the stroke.) Just before $t = 0$ this load had been producing a deflection all along the rod given by

$$u = \frac{W_{oD}x}{AE}$$

Therefore, another end condition is

$$\text{at } t = 0,\ u = \frac{W_{oD}x}{AE}$$

The method of solution is again similar to that used for a string and is not given here. The vibration of the plunger is

$$u_L = \frac{8W_{oD}L}{AE\pi^2}e^{-nt}\sum_{s=1,3,5,\ldots}^{s=\infty}\frac{1}{s^2}\left(\cos p_1 t + \frac{n}{p_1}\sin p_1 t\right) \quad (4)$$

where $$p_1 = \sqrt{\frac{s^2\pi^2a^2}{4L^2} - n^2}$$

The force at the polished rod is

$$\frac{4W_{oD}}{\pi}e^{-nt}\sum_{s=1,-3,5,-7\ldots}^{s=\infty}\frac{1}{s}\left(\cos p_1 t + \frac{n}{p_1}\sin p_1 t\right) \quad (5)$$

It is interesting to note that the free vibration of the rod is not an harmonic motion, but is given by an infinite series. The curve of the force at the polished rod plotted against time is not a sine wave, but a "square" wave. This square-wave type of free vibration shows up very clearly on the oscillograms of polished-rod force, Figs. 6 and 7.

Unless the damping is quite large or the speed is quite low, the maximum values of u_L, and polished-rod force due to free vibration, are double what would be produced by the same load if slowly applied.

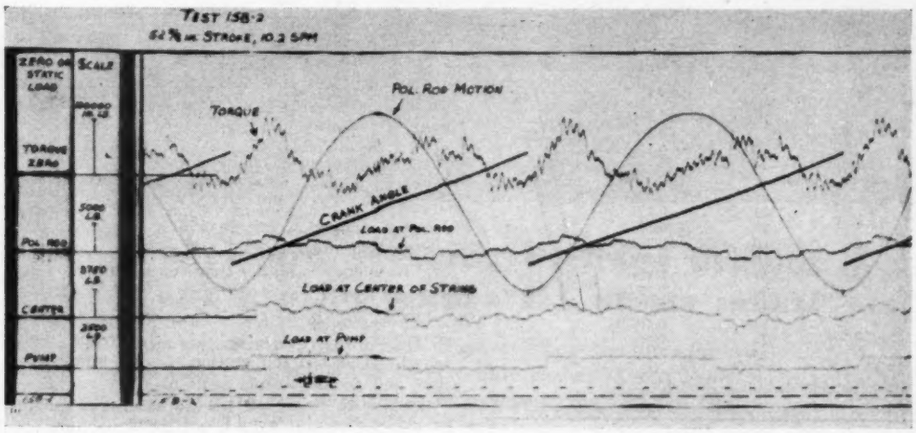
The peak force on the plunger during the upstroke is the weight of the fluid plus a force necessary to accelerate the fluid column. This acceleration force can be calculated with sufficient accuracy by assuming that the plunger moves up against an initially stationary fluid column with harmonic motion. This is not strictly true, of course, but, since this force is a relatively small factor, great accuracy is not required. The method of solving for this fluid acceleration force is given in Appendix 1 (included in Part II). It is shown there that the peak force from the plunger necessary to accelerate the fluid column is

$$\frac{W_oE_oS_P\omega}{2a_oL\delta_o} \quad (6)$$

where

W_o = weight of fluid supported by plunger (full height of column on net area of plunger)
E_o = modulus of elasticity of fluid column
S_P = plunger stroke
ω = angular velocity of crank, radians per second
a_o = velocity of sound in fluid
L = depth of well
δ_o = weight of fluid per unit volume

Damping factor.—One of the characteristics of a well which must be known before using the equations derived here is the damping factor γ. Strictly speaking, the use of such a factor is correct only if the damping force is proportional to the velocity. Actually, we know that the damp-



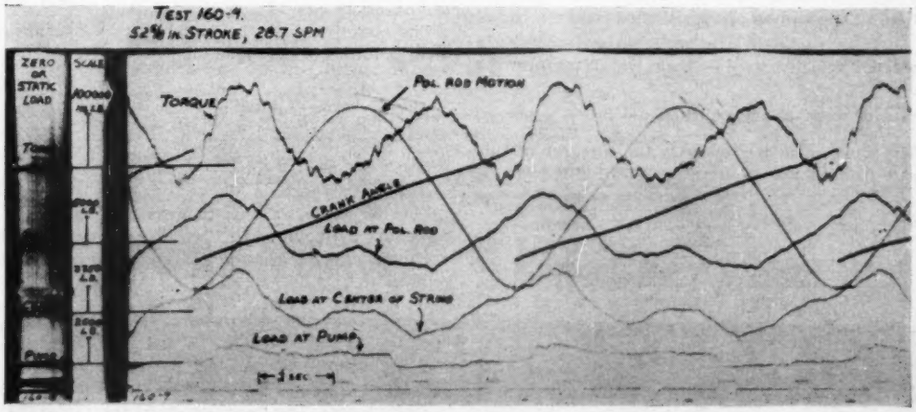


Fig. 6 (top)—Partial oscillograph record for slow-speed pumping
Fig. 7 (bottom)—Partial oscillograph record for high-speed pumping

ing of a sucker rod is made up of various types of resistance, some independent of velocity and some more or less proportional to it. It has been shown,* however, that the equations for velocity damping can give good results in such a case if an "equivalent damping factor" is used, which causes the same amount of energy to be absorbed per cycle as is absorbed by the actual damping forces which exist. This equivalent damping factor depends upon amplitude and frequency, so on a given well it is not the same for slow and fast pumping.

One accepted method of measuring the damping of a system is to compare the amplitudes of successive periods of a free oscillation. Several records of the free oscillations of the rods following an impact were obtained but were not found to give accurate values of γ. The objection to this method of determining γ is that the measurement is not made at the same rod velocity as that which occurs while pumping. As mentioned, when the friction is not proportional to the velocity, the correct value of equivalent damping factor is dependent upon amplitude and frequency.

The best method of measuring γ is a direct measurement of the energy absorbed by the rods during each cycle. This can be obtained by taking a dynagraph card while operating the rods up and down without any traveling valve in the pump or by subtracting the energy per cycle measured by a bottom-hole gage from that measured by a gage at the top during normal operation. Table 1 shows values of γ measured both with and without the traveling valve in the plunger. The method of converting the value of energy into a value of γ is as follows:

TABLE 1—VALUES OF DAMPING FACTOR, γ,* CALCULATED FROM MEASURED ENERGY ABSORPTION

Normal stroke length, in.	Strokes per minute	Values of γ determined with traveling valve	Values of γ determined without traveling valve
24	10	0.41	...
	16	0.26	...
	24	0.19	...
	30	0.16	...
34	10	0.27	...
	16	0.20	...
	24	0.17	...
	30	0.16	...
44	10	0.21	0.25
	16	0.19	0.18
	24	0.15	0.13
	30	0.15	0.14
54	10	0.21	...
	16	0.19	...
	24	0.15	...
	30	0.15	...

*For critical damping, $\gamma = 2$.

The force at the polished rod is given by Equation 3. The motion of the polished rod is $\frac{S}{2}\cos \omega t$ and its velocity is $-\frac{S}{2}\omega \sin \omega t$. Therefore, the rate of work at the polished rod is $\frac{PS}{2}\omega \sin \omega t$. The work done per cycle is the integral of this rate from $\omega t = 0$ to $\omega t = 2\pi$. We find it to be

$$\text{Work per cycle} = \frac{P_{max}\pi S}{2}\sin\left(\phi_\cdot + \arctan\frac{\beta}{\alpha}\right)$$

$$= \left(\frac{\pi AES^2}{4L}\right)\left(\frac{R_1\pi r}{2}\right)\sqrt{1+\frac{\gamma^2}{r^2}}\,\sin\left(\phi_1+\arctan\frac{\beta}{\alpha}\right) \quad (7)$$

Fig. 8 shows the quantity

$$K_2 = \left(\frac{R_1\pi r}{2}\sqrt[4]{1+\frac{\gamma^2}{r^2}}\right)\sin\left(\phi_1+\arctan\frac{\beta}{\alpha}\right) \quad (8)$$

*"Steady Forced Vibration as Influenced by Damping," by L. S. Jacobsen, Trans. A.S.M.E., Vol. 52, 1930, APM-52-15, pp. 169-81.

plotted against γ for different values of r. By using Fig. 8 and Equation 7, any measured value of work per cycle may be converted into the corresponding value of γ for a known set of conditions.

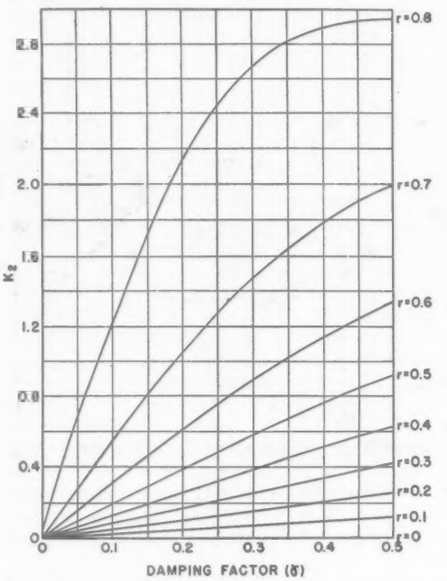


Fig. 8—Factor for calculating damping constant from energy absorbed by friction

Natural frequency of rods.—In using the foregoing formulas it is necessary to calculate r, the ratio between the pumping frequency and the lowest natural frequency of the rods. For a smooth rod, r is as given in Equation 2*b*.

An actual sucker-rod string, however, is not smooth since the joints are rather abrupt changes and add to the mass of the rod, but have very little effect upon the stiffness. The easiest way to bring this into the calculations is to increase the value of δ, the density of the material, to a higher value δ_e, where

$$\delta_e = \delta \times \frac{\text{Actual weight of rod strings}}{\text{Weight of smooth rod without joints}} \quad (9)$$

For a stepped string, in which larger rod sizes are used at the top than at the bottom, the natural frequency is higher than for a uniform string of equal length.

Let L_1, L_2, L_3 be the length of string having cross-sectional areas A_1, A_2, A_3, respectively. Length L_1 is the top section, L_2 the middle section, and L_3 the bottom section.

Let $p = 2\pi$ times the lowest natural frequency of the rod string. This is a quantity which corresponds dimensionally to ω, the angular velocity of the crank.

The quantity p can be found from a trial-and-error solution of the equation

$$\frac{\frac{A_1}{A_2}\tan\frac{pL_2}{a}+\tan\frac{pL_1}{a}}{\frac{A_1}{A_2}\tan\frac{pL_1}{a}\tan\frac{pL_2}{a}} = \frac{A_2}{A_3}\cot\frac{pL_3}{a} \quad (10)$$

The derivation of this expression is given in Appendix 2 (included in Part II).

If only two sizes of rod are used, this equation reduces to

$$\tan\frac{pL_1}{a}\tan\frac{pL_2}{a} = \frac{A_1}{A_2} \quad (11)$$

and for a single size of rod it reduces to Equation 2*b*.

Static loads.—The formulas given are all for the calculation of dynamic effects. The major part of the polished-rod load is usually due to the static weight of the rods and fluid, so the static loads should be considered carefully. Fig. 9 shows the essential parts of a simplified well. The tubing is full of fluid and the casing fluid level is as indicated. The tubing is shown with the same

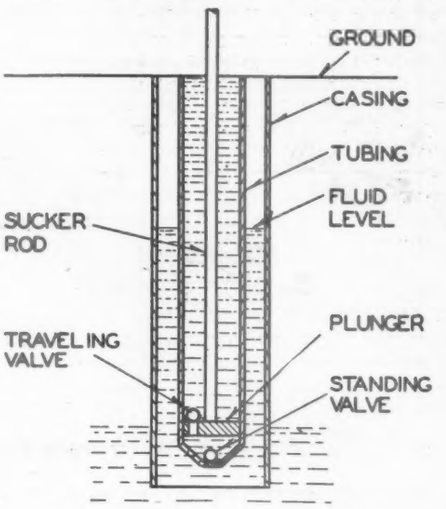


Fig. 9—Simplified vertical section of well

diameter as the plunger. Actually the tubing is larger than the plunger, but this does not affect the calculations. The important part of the fluid column is that supported by the net area of the plunger. Any additional fluid is supported by the tubing itself and does not enter into the calculations for rod forces.

Let W_{R_1} = weight of rods above casing fluid
W_{R_2} = weight of rods below casing fluid
W_{o_1} = weight of fluid in tubing above casing fluid level
W_{o_2} = weight of fluid in tubing below casing fluid level

Subscript b refers to buoyant force. For example W_{R_1b} = buoyant force on length of rod which extends above casing fluid level.

During the downstroke, the static load on the polished rod is

$$P_D = W_{R_1} + W_{R_2} - W_{R_1b} - W_{R_2b}$$

During the upstroke, the static load on the polished rod is

$$P_U = W_{R_1} + W_{R_2} + W_{o_1} + W_{o_2} - W_{R_2b} - W_{o_2b}$$

But

$$W_{o_2} = W_{o_2b} \text{ and } W_{R_1} + W_{R_2} = W_R$$

therefore

$$P_U = W_R + W_{o_1} - W_{R_2b} \quad (12)$$

For interpreting records from bottom-hole gages, we wish to know the differential fluid load, which is the actual change in plunger force which occurs at each end of the stroke. If we call this differential fluid load W_{oD}, then

$$W_{oD} = P_U - P_D = W_{o_1} + W_{R_1b} \quad (13)$$

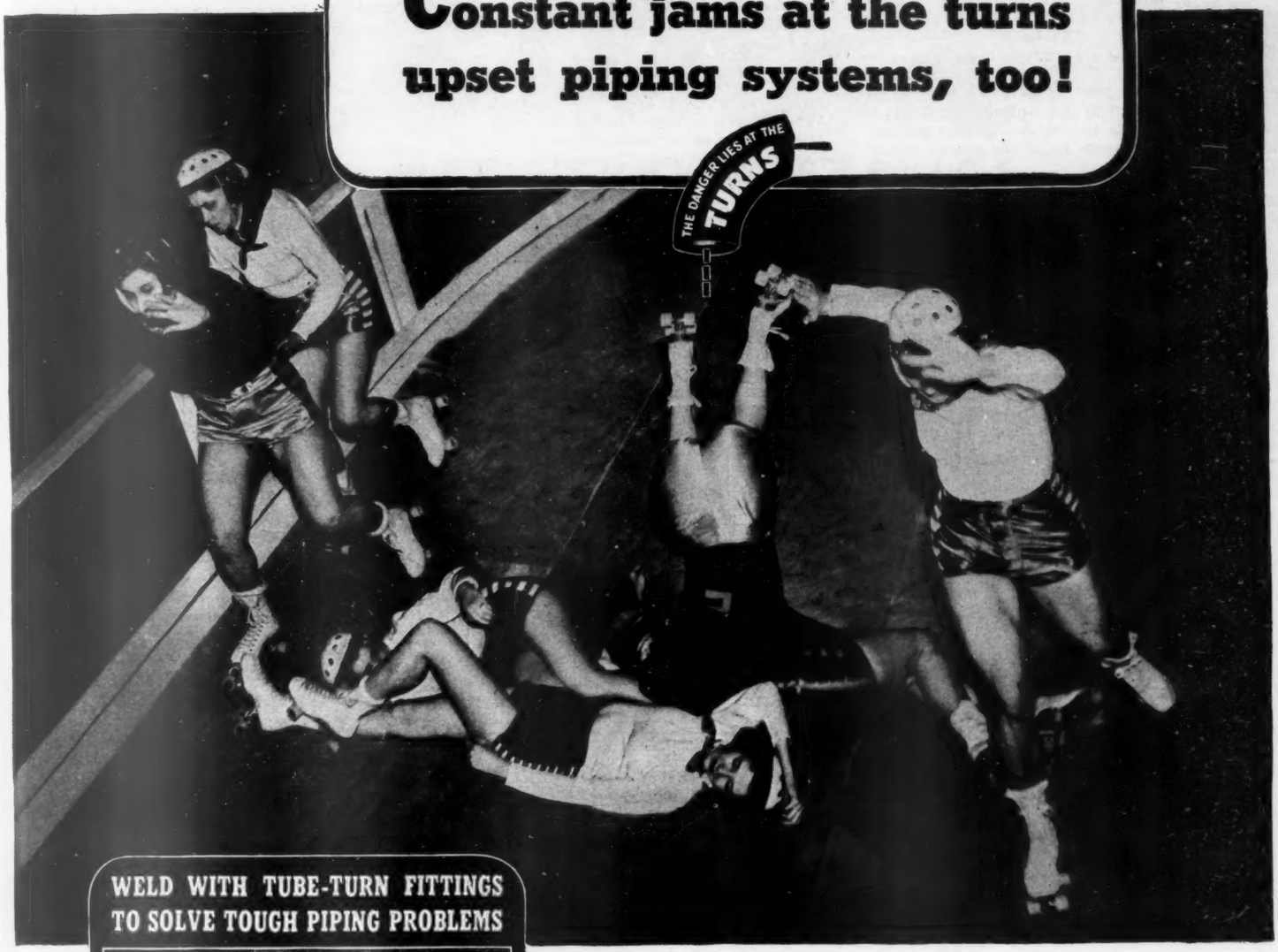
It is interesting to note from Equation 13 that the differential fluid load is the weight of a column of fluid whose cross-section is the full plunger area and whose height is the distance from the casing fluid level to the surface.

Stretch of tubing.—In wells where the tubing is not anchored near the pump, there may be some effect due to the elasticity of the tubing. The only variation in the force on the tubing is the addition of the differential fluid load W_{oD} at the start of the downstroke and its removal at the start of the upstroke. The stretch produced in the tubing by W_{oD} statically applies is

$$\frac{W_{oD}L}{A_TE}$$

where A_T = area of cross-section of tubing wall.

Constant jams at the turns upset piping systems, too!



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Welding Fittings

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Calculation of peak polished-rod load.—From the analysis given in this paper it is possible to develop a formula for calculating peak polished-rod force. It is made up of the sum of several quantities.

1. Static load (see Equation 12): $W_R + W_1 - W_{Rb}$
2. Force to accelerate rods (see Equation 3*a*):

$$W_R\left(\frac{ES}{2L^2\delta_o}\right)K_1$$

3. Force to accelerate fluid (see Equation 6):

$$W_o\left(\frac{E_o\omega S_P}{2a_oL\delta_o}\right)$$

4. Because of free vibrations, the effect of a force on the plunger is doubled when it reaches the polished rod. These forces are already contained once in the foregoing list. In order to double their effect, they must be added in again. They are:

(*a*) Differential fluid load (see Equation 13):

$$W_{o1} + W_{R1b}$$

(*b*) Force to accelerate fluid:

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The sum of these quantities is the peak polished-rod load

$$\text{PPRL} = W_R\left(1 + \frac{ESK_1}{2L^2\delta_o}\right) + W_o\left(\frac{E_o\omega S_P}{a_oL\delta_o}\right) + 2W_{o1} + W_{R1b} - W_{Rsb}$$

But $W_{R1b} + W_{Rsb} = W_{Rb}$ = buoyant force on full rod string

$W_{o1} + W_{R1b}$ = differential fluid load = W_{oD}

Then

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where dimensions are expressed in inches, pounds, and seconds.

Values of K_1 are given in Figs. 4 and 5.

It should be remembered that these formulas give an upper limit for polished-rod force, which will be higher than the actual value that will usually occur. Actually the peaks from the various dynamic effects will not occur simultaneuosly, as has been assumed previously. The addition of the actual stress waves is possible but too laborious to be used frequently. Fig. 10 shows an example in which the stress waves were calculated and added in true phase relationship and are compared with test results.

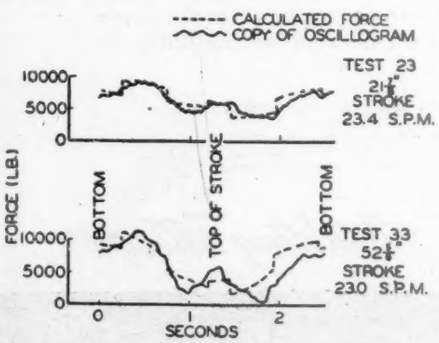

Fig. 10—Comparison of actual and calculated polished-rod forces for complete cycle

(3,500-ft. string; 2,250-ft. fluid head; ¾-in. rods; 1¼-in. plunger)

Calculation of plunger travel.—In calculating the plunger travel we can make use of Equation 2 and then subtract the amplitude of free vibration produced by the fluid load. For plunger stroke we get

$$S_P = \frac{S}{R} - \frac{2W_{oD}L}{AE} \quad (15)$$

Values of $1/R$ are given in Fig. 3.

If the tubing is not anchored and we wish to know the relative motion between the plunger and the pump barrel, then the effective plunger stroke is

$$\text{EPS} = \frac{S}{R} - \frac{2W_{oD}L}{E}\left(\frac{1}{A} + \frac{1}{A_T}\right) \quad (15a)$$

where A_T = cross-sectional area of tubing wall, and dimensions are inches, pounds, and seconds.

Simplified formulas for field use.—When making calculations in the field, it is not convenient to use the formulas just given. It is possible to simplify those formulas for use over a limited range of conditions by assuming no damping in the rod string ($\gamma = 0$). The authors did this and at the same time modified the constants to make the calculated results agree more closely with the test results. The "field formulas" thus derived will be given. They agree with test results more closely than the complete formulas in the range which the tests cover but must be used with caution for abnormal conditions.

$$\text{PPRL} = W_R - W_{Rb} + W_{oD} + 45SN[17A_R \tan (0.002LN)^\circ + A_o] \quad (16)$$

$$\text{EPS} = \frac{S}{\cos (0.002LN)^\circ} - \frac{W_{oD}L}{24(10^6)}\left(\frac{1}{A_R} + \frac{1}{A_T}\right) \quad (17)$$

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●

Torque Converters Applied to Drilling and Servicing Rigs

(Continued from Page 26)

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There are now four of the new-type rigs in use. The 6,500-ft. size can use either two or three 200-hp. engines, while the 4,000-ft. size can use either one 200-hp. engine or two 175-hp. engines. The depth ratings for both sizes are made on the basis of 4-in. drill pipe.

More and Smaller Engines

It is becoming increasingly apparent that future rigs will be using more engines of a smaller size than in the past, for the small units can be obtained more readily. The new rig is designed with this in mind, and provisions are made for adding another engine-torque-converter unit quite easily.

The transmission speeds of the new rigs are selected so that the speed ratio across the torque converters need never exceed 2¼ to 1 during all normal operations in drilling to the maximum rated depth. As each stand of drill pipe is pulled in any given ratio, the loss of efficiency is decreased proportionately until it becomes about 15 per cent at the point when torque multiplication in the converter is approximately 1 to 1¼. It has been found on the first of the new rigs that under this type of application the converters have been able to operate for a year without service.

Comparable to the new-type drilling rig is a combination cable-tool and rotary cleanout or workover unit of new design. Like the rotary drilling rig this unit uses a torque converter for all services. In cable-tool drilling with an internal-combustion engine the use of a torque converter not only improves hoisting conditions but also imparts a more favorable drilling motion to the tools. The lack of a rigid mechanical connection between the spudding arm and the drilling engine makes it possible for the tools to drop freely, and this drop takes place without any appreciable speeding up of the engine on downstroke. Proper balancing of the unit with flywheel rims, as were used on the old cable-tool steam engines, prevents the drop from becoming too rapid.

The flywheel weights on the unit have a purpose other than regulating the drop of the tools. In the first application of the torque converter to cable-tool drilling it was noted that sticky formations could combine with the "slip" in the converter to rob the tools of much of their snap. Use of flywheel rims of the proper weight, it was found, provides enough inertia to overcome this effect.

The workover unit with torque converter is built for pulling liners, cleaning out, drilling deeper, and performing other reconditioning jobs by either cable-tool or rotary methods in wells up to 6,000 ft. deep. At this depth, however, it is necessary to use 2½-in. upset tubing for drill pipe if the rotary method is employed. The machine can also be used as a regular rotary rig for drilling wells to a maximum of 3,000 ft. with 3-in. drill pipe. In uses one engine which can be 100 to 175 hp.

The combination machine can be changed from a cable-tool rig to a rotary rig in about 30 minutes, or vice versa. Since the torque converter is effective on all services, the performance is similar to that of a steam rig or d.c. electric rig. High torque is obtained at low speeds, and even though the hoist drum is completely stalled, the engine will continue to run at normal speed, in which case the converter will apply to the load a starting torque five times greater than the engine-shaft torque.

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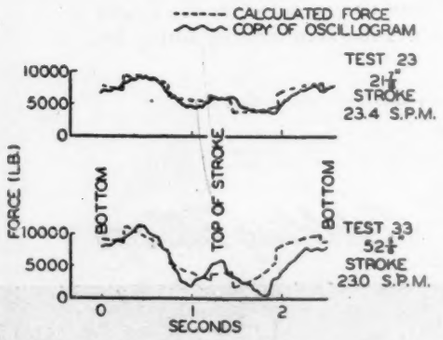

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Development, Operation and Valuation of Oil and Gas Properties—Part 6

Flow of Gas-Oil Mixtures Through Media of Uniform Permeability

By PARK J. JONES
Petroleum Engineer, The Texas Company

This is the sixth in a series of articles by the author appearing in The Oil and Gas Journal on Development, Operation and Valuation of Oil and Gas Properties. Previous subjects discussed were "Effective Porosity, Specific Permeability and the Geometry of Spacing," issue of May 28; "Flow of Homogeneous Fluids Through Linear Systems," issue of June 4; "Flow of Homogeneous Fluids Through Radial Systems," June 11; and "Flow of Homogeneous Fluids: Water in Virgin Oil and Gas Pays," issue of June 18 and "Flow of Oil-Water Mixtures Through Media of Uniform Permeability," issue of June 25. Installment 7 appears next week and will be titled, "Behavior of Natural Gases."

1. *Saturation.*—Let the effective porosity of medium saturated with oil and gas be represented by unity, then

$$S_g = 1 - S_o = 100\ (1 - S_o) \qquad (1)$$

where

S_g = free gas saturation, fraction or per cent
S_o = oil plus solution gas saturation, fraction or per cent.

In order to illustrate the effect of gas saturation on the rate of oil flow, and vice versa, the work of Botset[1] and Muskat[2] is here briefly reviewed.

2. *Effective permeability vs. saturation.*—Muskat and his colleagues forced gas-liquid mixtures through unconsolidated sands ranging in permeability from 11 up to 260 darcys. The results of these experiments are shown by the curves in Fig. 13. Botset, based on the flow of gas-liquid

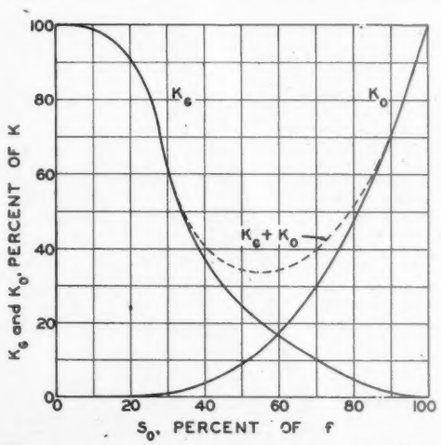


Fig. 13—K_g and K_o vs. S_o (after Muskat, A.I.M.E.) (Unconsolidated sands, $11 \leqq K \leqq 280$)

mixtures through a 4-in. by 4.48-ft. sandstone core having a permeability of 0.5 darcy, obtained the results shown by the solid curves in Fig. 14. The dashed curves in Fig. 14 indicate the effective permeabilities of a 17.8-darcy unconsolidated sand.

3. *Characteristics of gas-liquid mixtures.*—The fundamental characteristics of gas-liquid mixtures in unconsolidated sands have been summarized by Muskat and coworkers thus:

1. A sharp drop in the effective permeability to liquids and a simultaneous very slow rise in the effective permeability to gases for high-liquid saturation.

2. The attainment of a high effective permeability to gases almost equal to specific permeability for liquid saturation ranging from 10 up to 20 per cent.

3. Gas-liquid mixtures are characterized by the property that steady-state conditions cannot be maintained until gas saturations become equal to at least 10 per cent. This is called "equilibrium" saturation.

The property of unequal changes in the respective effective permeabilities results in a rapid decrease of the sum of the effective permeabilities in the region of high-liquid saturations. This is shown by the dashed curve in Fig. 13 from which it will have been noted that the effective permeability to gas-liquid mixtures can be as low as one-third of the specific permeability.

The fact that gas permeabilities attain almost 100 per cent of the specific values for liquid saturations ranging from 10 up to 20 per cent indicates that liquids occupy a region in pore spaces through which gases would not flow even if liquids were not present. Such "dead" pore spaces are not to be confused with noneffective porosity.

4. *Equilibrium saturation.*—The equilibrium saturation for both the consolidated and unconsolidated sands is about 90 per cent. Above the equilibrium saturation, the curves coincide, and in this region permeability to gas is essentially zero. Botset concludes that, even in the case of consolidated sands, the initial gas coming out of solution as a result of pressure decrease is held in the pores until a definite gas-saturation is achieved, after which, if the pressure difference is maintained at a sufficiently low value, gas continues to flow through without displacing any additional oil. This fact has an important bearing on ultimate recoveries in reservoirs producing oil by solution-gas drive and having interconnected pay intervals where permeabilities vary considerably.

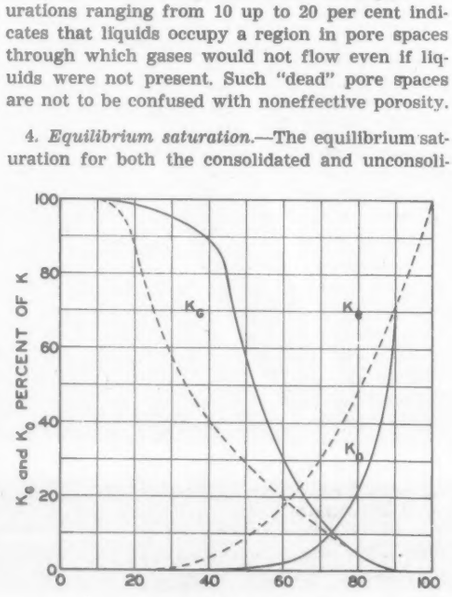


Fig. 14—K_g and K_o vs. S_o (after Botset, A.I.M.E.)
- - - - Unconsolidated sand $K = 17.8$
——— Consolidated sand $K = 0.5$

5. *Effect of equilibrium saturation on ultimate recovery.*—Equilibrium saturation has an important bearing on ultimate recoveries, for gas can displace oil from less permeable intervals into adjacent relatively more permeable intervals only until equilibrium saturation is attained. Thereafter, assuming the rate of pressure decline is low enough, gas can escape from the less to the relatively more permeable intervals without displacing additional oil. In this manner, the ultimate recovery from the relatively tight intervals of some oil reservoirs can equal the recovery at equilibrium saturation corrected for shrinkage of the oil produced and the oil not produced. Accordingly, in solution-gas drive reservoirs the recovery from the relatively tight pay intervals may not exceed 10 per cent of the effective porosity.

6. *Flowing gas-oil ratios.*—The gas-oil ratio Q_g/Q_o expressed in barrels of free gas per barrel of oil plus solution gas flowing through any cross-section having an oil saturation S_o is defined by effective permeability ratios, Fig. 15, thus:

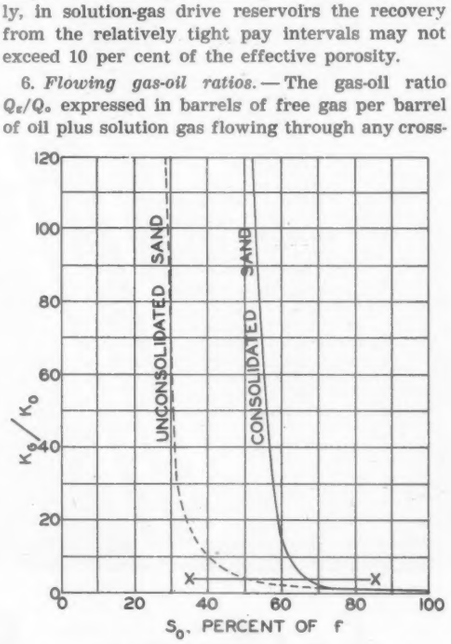


Fig. 15—K_g/K_o vs. S_o (after Botset, A.I.M.E.)

$$\frac{Q_g}{Q_o} = \frac{K_g}{K_o}\,\frac{\mu_o}{\mu_g} \qquad (1)$$

The corresponding gas-oil ratio G expressed in

standard cubic feet per barrel of oil plus solution gas is

$$G = \frac{K_g}{K_o}\,\frac{\mu_o}{\mu_g}\,\frac{P}{14.7}\,\frac{520}{T}\,\frac{5.614}{Z} \qquad (2)$$

It follows that the foregoing equations must be satisfied in order to reduce liquid saturation down to the values defined by K_g/K_o. Conversely, liquid saturation in reservoirs can be reduced down to some preassigned value provided it is physically possible and economically practicable to achieve the gas-oil ratios required by the above equation. Liquid saturation equals the fraction of the pore space occupied by interstitial water plus oil and dissolved gas, that is, the space not occupied by free gas.

Example 1.—The circulated gas-oil ratio on a gas-drive project is limited economically to 20 M.c.f. per barrel of oil produced. Neglecting shrinkage of the oil not produced, what is the maximum possible ultimate recovery from 32 per cent porosity unconsolidated sand reservoir under the following conditions? Minimum flowing pressure = 150 p.s.i. abs., reservoir temperature = 560° abs., viscosity of gas at reservoir pressure and temperature = 0.015 c.p.s., viscosity of oil at reservoir conditions = 2.0 c.p.s., volume factor or original space occupied by a barrel of oil plus solution gas = 1.2 bbl./bbl., and compressibility factor = 1.0.

The flowing gas-oil ratio under reservoir conditions is

$$\frac{Q_g}{Q_o} = 20{,}000\,\frac{1}{10}\,\frac{1}{5.614}\,\frac{560}{520} = 383 \text{ bbl./bbl.}$$

By Equation (6.8.1)

$$\frac{K_g}{K_o} = 383\,\frac{0.015}{2} = 2.9$$

From Fig. 15 corresponding to 2.9 for unconsolidated sand the residual liquid saturation is 53 per cent. Whence, neglecting shrinkage of the oil not produced and assuming 100 per cent gas-drive efficiency and uniform permeability the maximum possible ultimate recovery available to primary methods of recovery and an artificial gas-drive project combined is

$$V = \frac{1.00 - 0.53}{1.2}\,(7758)\,(0.32) = 970 \text{ bbl./acre-ft.}$$

Example 2.—If in Example 1 the interstitial water content is 20 per cent; recovery by primary methods (solution-gas drive) is 500 bbl./acre-ft., shrinkage of the oil not produced is not neglected, and the efficiency of the secondary recovery method by gas drive is 70 per cent, what is the corresponding ultimate recovery and ultimate recovery factor?

Space originally occupied by 500 bbl. $= \dfrac{500 \times 1.2}{7758 \times 0.32}$

Space originally occupied by 500 bbl. plus water = 24.2 + 20 = 44.2 per cent of porosity

Space originally occupied by oil not produced = 100 — 44.2 = 55.8 per cent of porosity

Space occupied by oil not produced after shrinkage $= \dfrac{55.8}{1.2}$ = 46.5 per cent of porosity

Space occupied by oil not produced after shrinkage plus water = 66.5 per cent of porosity

Oil producible at 100 per cent gas-drive efficiency = 66.5 — 53 = 13.5 per cent of porosity

Oil producible at 70 per cent gas-drive efficiency = 0.7 × 13.5 = 9.45 per cent of porosity

Oil produced by gas-drive = 7758 × 0.32 × 0.0945 = 230 bbl./acre-ft.

Ultimate recovery = 500 + 230 = 730 bbl./acre-ft.

Over-all recovery factor $= R = \dfrac{730 \times 1.2}{7758 \times 0.32}$

= 35.4 per cent of porosity.

Example 3.—The circulated gas-oil ratio on a gas-drive project is limited to 20 M.c.f. per barrel of oil produced. Neglecting shrinkage of the oil not produced, what is the maximum possible recovery from a 20 per cent porosity consolidated sand reservoir under the conditions of Example 1 except that the minimum flowing pressure = 300 p.s.i. abs.?

As in this case the pressure is twice that in Example 1,

$$\frac{K_g}{K_o} = \frac{2.9}{2} = 1.45$$

From Fig. 15 corresponding to 1.45 for consolidated sand the residual liquid saturation is approximately 70 per cent. Whence, neglecting shrinkage of the oil not produced and assuming 100 per cent gas-drive efficiency, the maximum possible ultimate recovery available to primary and secondary (gas-drive) methods combined is

$$V = \frac{100 - 70}{1.2}\,(7758)\,(0.20) = 390 \text{ bbl./acre-ft.}$$

The corresponding recovery factor R is given by

$$R = \frac{390 \times 1.2}{7758 \times 0.20} = 30 \text{ per cent of porosity.}$$

7. *Limitations in the field.*—From the foregoing discussion it is evident that the ultimate recovery from oil reservoirs available to natural and artificial gas-drives is limited by nonuniform distribution of specific permeability and an upper limit on gas-oil ratios. Gas-drive operations in the field, exclusive of water advancement by capillary pressure and movement of oil caused by gravity, are limited to the region below the $X - X$ line in Fig. 15.

References

1. Botset, H. G., "Flow of Gas-Liquid Mixtures Through Consolidated Sands," Trans. A.I.M.E., 1939.

2. Muskat, Wyckoff, Botset, and Meres, "Flow of Gas-Liquid Mixtures Through Sands," Trans. A.I.M.E., 1937.

SAFETY — Saving Men and Metal in Natural-Gasoline Plant

AFTER close investigation over a period of several years involving gasoline plant fires, it was decided by Skelly Oil Co.'s engineers that the chief cause was lack of sufficient safety-valve capacity to relieve vapors from volatile gasoline stored in low-pressure tankage; also, from deadweight safeties popping and throwing the weights to the outer end of the lever, thereby changing the setting. As a result, a standard safety arrangement has been adopted for use in the natural gasoline and gas department, wherein two 4-in. deadweight safety valves are installed parallel on each 10 ft. by 40 ft. horizontal 40-lb. w.p. storage tank, and the outlets from these valves piped beyond the outer ends of the tank, so that in case of fire if the tank should pop all burning vapors, which are being released, it will not add to the heat of the tank. All deadweights are carefully tested and set on the levels for the desired pressure, the weight pins inserted and the weight securely riveted in place so that in popping the weight cannot slip out of adjustment.

Runways with guard rails are constructed over the tanks and located so that all safety valves and other adjustable equipment may be reached from the guarded runways. Operators are required to lift each lever once each day to avoid sticking valves.

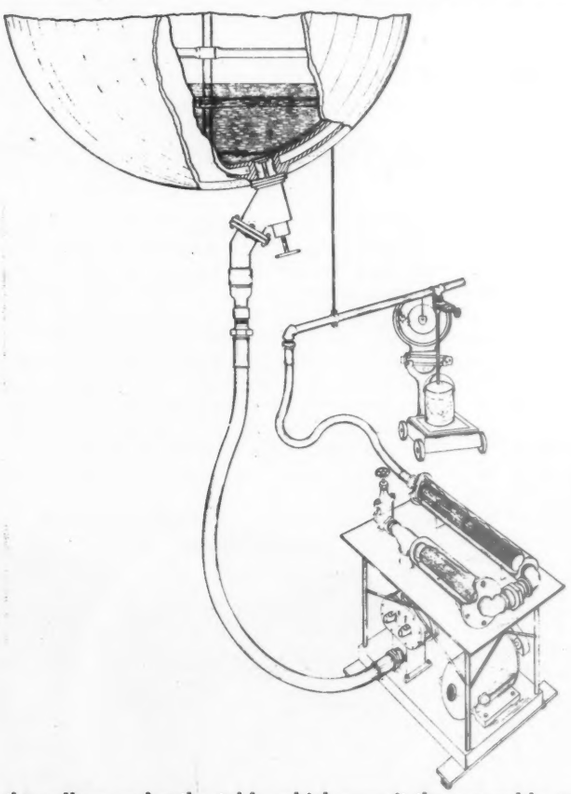
Since adopting such standards, one entire battery of eight 10-in. by 40-ft. and four 7-in. by 30-ft. tanks have burned from a broken gasoline and gas line igniting. No tanks in the battery blew up from excessive pressure, but some of the tanks did rupture at the top where the heat was so great that the metal almost reached the fusing point and stretched thin under the normal working pressure. The ruptures were light and did not move the tank on the foundation.

The original cast-iron or bronze inner valves of the safeties have been replaced with neoprene seats which have reduced leakage to a minimum. All such tanks are equipped with 2-in. vacuum relief valves to present condensation of vapors on sudden atmospheric temperature drops from creating a vacuum and pulling the tank in. The average battery of low-pressure tanks can be equipped with this type of safety valve and blow-off line without requiring special connections. In many instances the equipment can be installed from stocks of standard relief valves and pipe in the warehouse. Care must be taken, of course, that the valves installed are in first-class condition and kept in this condition when in place.

Refinery IDEAS ... that save $ $ $

Screen Avoids Chance of Grease Lumps

Between the grease kettle and the can-filling scale a refiner has installed a series of screens which eliminate any chance for a lump to enter the can in which the finished product is shipped. The detailed assembly and method of operation are illustrated in the accompanying drawing. The two filtering elements or screens are on top of the pump table. Below are the grease pump and electrically driven motor. Note also should be made of



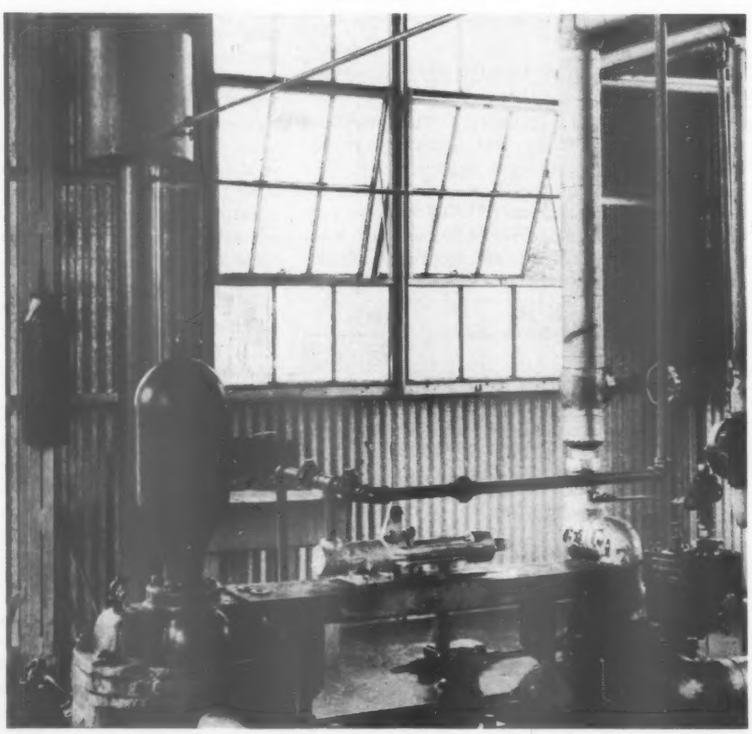
the rollers under the table which permit the assembly to be moved to any convenient location. The screens used as filter elements are nothing more than cylinders of noncorrosive, fine-mesh wire slipped over perforated closed pipe nipples and located inside the respective housings. These housings may be conveniently opened for inspection and cleaning as suggested by the four bolt heads shown in the cut-away of the first screen. In the first position a 40-mesh screen is used and the second or longer screen is 100-mesh. In actual plant operation such extreme care is taken in charging the grease kettle and in mixing that little chance exists for lumps to accumulate but the screens add an unquestionable check on the freedom of the product from lumps when canned.

Condensate Bled Off Through Turbine

A single-stage turbine which drives the cooling-water circulating-pump has been designed for use in one plant to take slugs of condensate from the steam line. It was purposely chosen to bleed the main steam line of condensate. The steam line to the turbine was tapped into the base of the main, which was given a slight downward slope from the boilers, and any condensate formed within the line is thus carried into the turbine along with its normal draft of steam. This water is easily handled.

Chemical Proportioning Pump Directly Connected to Water Feed Pump

The proportion of raw boiler feed water and treating chemical is held constant at one plant by connecting the small chemical feed pump directly to the raw water pump. Here the chemical pump is shown mounted on a horizontal plate, one end of plate resting on the water side of the main pump while the other end rests on an extension from the steam cylinder end. A slot cut through the plate immediately above the rocker arm of the main pump permits an arm to be extended from the small pump to the larger one. This swings through a bearing in the horizontal plate and thereby provides reciprocating motion transferred from the larger pump to the small one. Obviously, the speed of the larger pump will determine the speed of the smaller one and this in turn means that the quantity of treating chemicals supplied will be held in direct proportion to the quantity of water pumped. The over-head chemical tank is at the left rear.



CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

EVALUATION

July 2, 1942

WORTH OF PROPERTY SHOWN WHEN INTEREST IS DEDUCTED

THE effect of interest on the income from invested capital is something which is frequently overlooked and is also a factor which causes an apparently profitable operation to not return the anticipated earnings. Justification for the deduction of interest from the earnings is evident when considering the case where the property is developed on borrowed capital.

Granting that an operator could borrow all of the needed capital, he would have to retire the debt in regularly scheduled installments and would have to pay interest on the balance. If he supplements his own with borrowed capital, he must pay interest on the portion obtained from the bank and is entitled to deduct interest for the portion furnished by himself. The fact that all of the capital is supplied by the operator of the property does not deprive him of this privilege, or lessen the necessity for deducting a reasonable interest charge. There is also the fact that if the operator did not use the capital to develop the property he presumably would be obtaining some income from loaning it or through investment in bonds and other securities.

Last week it was shown that yearly income provided a sounder basis for evaluating the worth of the property than the rule-of-thumb method of using the total estimated income from the property. The same property will be used to illustrate the computation of earnings when deducting interest charges. The property, a 160-acre undeveloped lease, is purchased for $96,000 and will require the drilling of four wells at 6-month intervals at a cost of $50,000 each. For the sake of simplicity the purchase price of the lease and the charges for the first well are considered as having been invested on January 1, 1941.

The results of such a computation are shown in the accompanying table. It will be noticed that with the interest deducted, the property does not show any profit until the fourth year and it requires 2 years more to wipe out the accumulated deficit so it is, consequently, the sixth year before any actual profit is realized from the operation.

Totaling of the profits will show that the investment of a total sum of $296,000 results in a profit of $50,612 which is a return of approximately 17 per cent in 15 years or an average of 1.13 per cent per year.

Considering the risks involved this property does not become particularly attractive as an investment. An overestimation in the reserves of only a comparatively small amount will result in a definite loss. There are also the hazards of increased taxation, more stringent proration and a cut in the price of the crude oil to be considered.

A contingency which would deprive the property of all profit would be the drilling of a dry hole. The investment would be reduced around $20,000 but the gross income from the property would suffer a reduction of $14,700 per year. It would also reduce the number of acres which could be credited to the reserves of the property and the ultimate production would be cut substantially.

Introducing a present-worth factor into the calculations reduces the profits to a greater extent. This is necessary as the earnings from the money invested now are not returned until a number of years have passed. The profit is obtained over a period of 10 years between the sixth and fifteenth year with the average time of return being 10 years from the time of investment.

The present worth of the anticipated profit is $29,888 so that an investment of $325,888 in some medium, such as mortgages, paying 6 per cent would return the same amount as the anticipated yield from an investment of $296,000 in this oil property with all of the risks involved.

For the property in question to show a reasonable profit, and for it to be an attractive investment, it will need to show a profit having a present worth of some $159,000 in 15 years' time or total of $455,000. It lacks $129,122 of having such value.

In previous installments of this feature, it has been stated that the purchase price or investment in an oil property may be placed at 60 to 70 per cent of the present worth of anticipated income. On this basis, the investment on this particular property would be between $195,000 and $228,000. Actually, considering the risks and the small return from this property, together with the high cost of the wells, it is questionable whether the lease has more than the nominal value of $1. Moreover, economies on every part of the operation are required if a reasonable profit is to be obtained. Under the conditions outlined, the property is, at best, marginal.

INCOME FROM PROPERTY WITH INTEREST DEDUCTED

Year	Inv.	Int.	Net	P or L	D & D	Bal.	Prof.	Present worth
1941 ...	$296,000	$10,260	$14,088	*$4,223	$9,713	$240,510	†$4,223	.....
1942 ...	290,510	15,931	16,100	*1,843	22,662	269,691	†6,066	.....
1943 ...	269,691	16,181	16,100	*81	25,900	243,872	†6,147	.....
1944 ...	243,872	14,632	16,100	1,468	25,900	216,504	†4,769	.....
1945 ...	216,504	12,990	16,100	3,110	25,900	187,494	†1,569	.....
1946 ...	187,494	11,250	16,100	4,850	25,900	160,025	3,281	$2,379
1947 ...	160,025	9,602	16,100	6,498	25,900	134,125	6,498	4,445
1948 ...	134,125	8,048	14,712	8,052	25,900	108,225	8,052	5,193
1949 ...	108,225	6,493	13,133	8,219	25,438	82,787	6,493	3,954
1950 ...	82,787	4,967	10,331	8,166	23,587	59,200	8,166	4,687
1951 ...	59,200	3,552	7,830	6,779	20,119	39,081	6,779	3,667
1952 ...	39,081	2,345	5,436	5,485	16,650	22,431	5,485	2,797
1953 ...	22,431	1,346	2,200	4,090	13,412	9,019	4,090	1,967
1954 ...	9,019	541	206	1,659	7,400	1,619	1,659	753
1955 ...	1,619	97	.....	109	1,619	.....	109	46

*Loss. †Losses accumulated until wiped out.

Converted by catalysis

"I didn't think you had it in you"

That is what an old time skimming plant refiner might well say to a barrel of crude oil if he came back on the job today to find the new special processes producing out of that barrel vital war products never before derived commercially from petroleum

Well, that barrel *didn't* have those products in it as it came from the well—only the makings

Universal catalytic processes convert and reform those makings into alkylate and other constituents of 100-octane gasoline, butadiene and styrene for synthetic rubber

Here are the processes:

Catalytic cracking	Hydrogen fluoride alkylation
Catalytic reforming	Isomerization
Polymerization	Cyclization
Aromatization	Hydrogenation
Dehydrogenation and	
Dubbscracking	Pyrolitic reforming
Unisol process	UOP Inhibitors

All those processes are at the service of all refiners under license from Universal

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Dubbs Cracking Process
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THE REFINERS INSTITUTE OF PETROLEUM TECHNOLOGY

Engineering Fundamentals

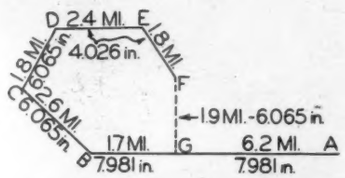
A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 23

July 2, 1942

COMPLEX GAS PIPE-LINE SYSTEMS

ADDITIONAL examples will be given to illustrate methods of calculation that may be applied in solving gas-flow problems dealing with complex systems.

Example 1.



Problem.—The solid lines in the sketch above represent a gas-gathering line as it is today. The system has been progressively extended from *B* to *C*, *C* to *D*, *D* to *E*, and *E* to *F*. What change in capacity from *F* to *A* would result if 1.9 miles of 6.065-in. pipe were laid from point *F* to connect to the 7.981-in. line at point *G*?

Solution.—At present the system is a series composed of 4.2 miles of 4.026-in., 4.4 miles of 6.065-in. and 7.9 miles of 7.981-in.

First, calculate the equivalent length of this series in terms of 7.981-in. pipe, as follows:

$$L_e = 4.2\left(\frac{254.5}{41.0}\right)^2 + 4.4\left(\frac{254.5}{122.4}\right)^2 + 7.9$$
$$= 161.8 + 19.0 + 7.9$$
$$= 188.7 \text{ miles of 7.981-in. simple pipe line}$$

After laying the proposed 1.9 miles of 6.065-in. line, the system would be a complex loop from point *F* to point *G*. One branch of the loop would be 1.9 miles of 6.065-in. line, while the other branch would be a series line made up of 4.2 miles of 4.026-in., 4.4 miles of 6.065-in. line and 1.7 miles of 7.981-in. line.

The equivalent length of the series branch of the loop in terms of 6.065-in. pipe would be,

$$L_e = 4.2\left(\frac{122.4}{41}\right)^2 + 4.4$$
$$+ 1.7\left(\frac{122.4}{254.5}\right)^2 = 42.21 \text{ miles.}$$

The equivalent length of the loop in terms of a simple 7.981-in. line is calculated as follows,

$$\frac{7.981^{2.667}}{\sqrt{L_1}} = \frac{6.065^{2.667}}{\sqrt{1.9}} + \frac{6.065^{2.667}}{\sqrt{42.21}}$$

Solving, $L_1 = 5.59$ miles of 7.981-in.

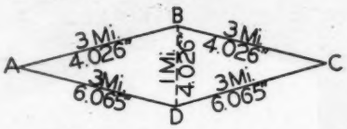
The entire system, after adding the proposed 6.065-in. line, then, would be equivalent to 5.59 + 6.2, or 11.79 miles of 7.981-in. simple pipe line.

So the ratio of the capacity after adding the proposed line to the capacity before making the installation would be,

$$\frac{Q_2}{Q_1} = \sqrt{\frac{L_1}{L_2}} = \sqrt{\frac{188.7}{11.79}} = 4.0$$

The capacity then is quadrupled by the addition of the 1.9 miles of 6.065-in. pipe.

Example 2.



Problem.—The solid lines in the sketch represent a portion of a hypothetical gas pipe-line system with possible sources of supply at points *A*, *B*, and *D*. The gas is delivered to point *C*.

If 1 mile of 4.026-in. pipe is laid joining points *D* and *B*, what percentage increase in the delivery capacity will result under each of the following conditions:

1. When all of the gas is supplied from point *D*?
2. When all of the gas is supplied from point *B*?
3. When all of the gas is supplied from point *A*?

Solution:

Condition 1.—Considering the delivery of gas from *D* to *C*, before adding the proposed line *DB*, the system is a loop, with one branch composed of 3 miles of 6.065-in. pipe and the other branch made up of 3 miles of 6.065-in. pipe in series with 6 miles of 4.026-in. pipe.

First, convert the series branch to an equivalent length of 6.065-in. pipe, as follows:

$$L_e = 6\left(\frac{122.4}{41.0}\right)^2 + 3$$
$$= 53.4 + 3 = 56.4 \text{ mi. of 6.065-in.}$$

The system can now be considered as a simple loop, the branches of which are 3 miles and 56.4 miles respectively of 6.065-in.

Then, resolving this loop into an equivalent length of simple 6.065-in. line,

$$\frac{1}{\sqrt{L_e}} = \frac{1}{\sqrt{56.4}} + \frac{1}{\sqrt{3}} = 0.71$$

Solving, $L_e = 1.982$ miles of 6.065-in.

After the 1 mile of 4.026-in. is installed between points *B* and *D*, the system is a complex loop. One branch is a simple line of 3 miles of 6.065-in. The other branch is made up of a lesser two-branch loop in series with 3 miles of 4.026-in. line. The lesser loop is composed of one simple branch of 1 mile of 4.026-in., and a series branch of 3 miles of 6.065-in. and 3 miles of 4.026-in.

Now resolve the series branch of the lesser loop into an equivalent length of 6.065-in. The equivalent length of the 3 miles of 4.026-in. in terms of 6.065-in. is,

$$L_e = 3\left(\frac{122.4}{41.0}\right)^2 = 26.7 \text{ miles}$$

The series branch, then, is equivalent to 26.7 + 3, or 29.7 miles of 6.065-in.

Next, convert the lesser loop into an equivalent length of 6.065-in., as follows,

$$\frac{6.065^{2.667}}{\sqrt{L_e}} = \frac{6.065^{2.667}}{\sqrt{29.7}} + \frac{4.026^{2.667}}{\sqrt{1}}$$

Solving, $L_e = 3.7$ miles of 6.065-in.

From calculations above, 3 miles of 4.026-in. is equivalent to 26.7 miles of 6.065-in. Then, the complex branch of the larger loop is equivalent to 3.7 + 26.7, or 30.4 miles of 6.065-in.

The system can now be considered as a loop with one branch being 30.4 miles of 6.065-in. and the other branch 3 miles of 6.065-in. Converting this loop to a simple 6.065-in. line,

$$\frac{1}{\sqrt{L_e}} = \frac{1}{\sqrt{30.4}} + \frac{1}{\sqrt{3}}$$

Solving, $L_e = 1.742$ miles of 6.065-in.

Employing the principle used in Example 1,

$$\frac{Q_2}{Q_1} = \sqrt{\frac{L_1}{L_2}} = \sqrt{\frac{1.982}{1.742}} = \sqrt{1.14}$$
$$= 1.068$$

So the increase in capacity from *D* to *C* due to laying the 1 mile of 4.026-in. pipe would be 6.8 per cent.

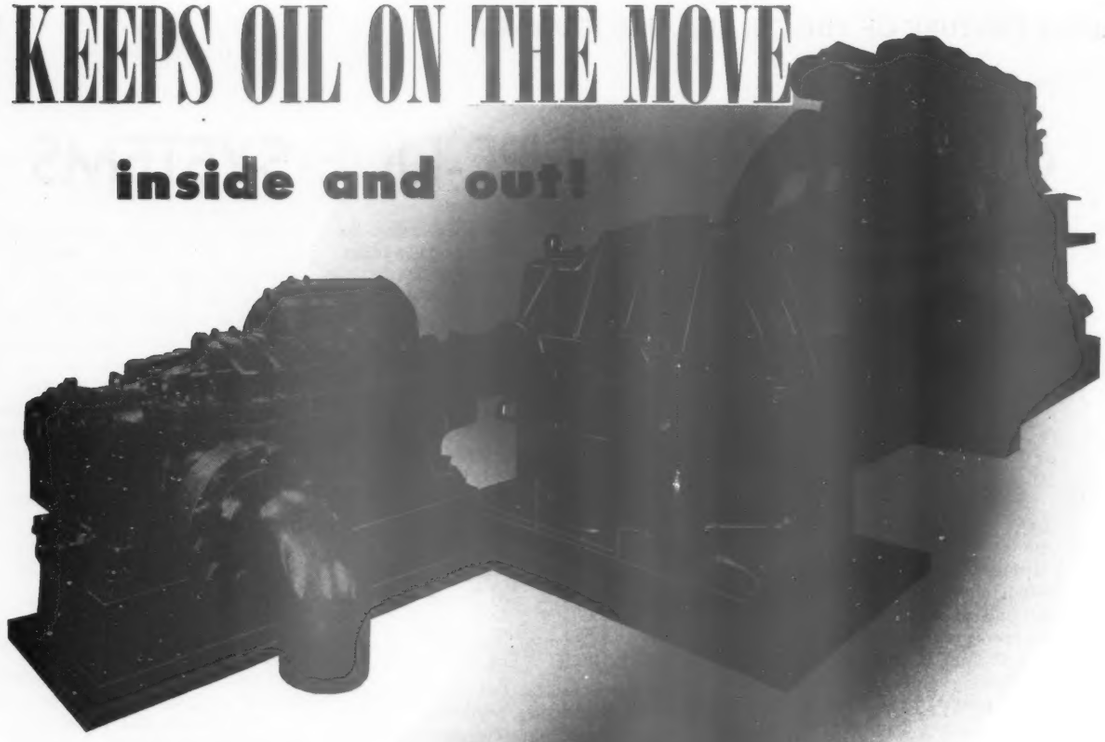
Condition 2.—The increase in capacity of the system when delivering all of the gas from point *B* would likewise be 6.8 per cent.

Condition 3.—A consideration of the given system when delivering all the gas from point *A* will show that no increase in capacity would result from laying the proposed 1-mile 4.026-in. line.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

KEEPS OIL ON THE MOVE

inside and out!



Solve high-speed pump drive problems with Westinghouse pressure-lubricated

speed increasers

Side view diagram of Westinghouse Speed Increaser showing positive forced-feed lubrication system with oil pump cooler, strainer and lines, all externally mounted and easily accessible. Oil pump is always primed, ready for instant duty.

Step up engine or motor speeds efficiently . . . *dependably* . . . with geared drives that are externally pressure-lubricated for longer life and less wear.

Westinghouse Type SU Speed Increasers facilitate operation of pumps at the most economical and efficient speeds. Westinghouse Speed Increasers meet today's demands for higher pumping speeds and continuous service. The forced-feed system of lubrication—entirely external for easy maintenance—insures a constant flow of oil to every moving part. Oil is continuously strained and cooled to protect gear teeth against wear.

This uninterrupted, dependable circulation of oil *inside* Westinghouse high-speed gear units is one reason why they keep oil moving more dependably *outside* into pipe lines. Get all the facts—see your Westinghouse representative or write Westinghouse Electric & Mfg. Co., Dept. 7-N, East Pittsburgh, Pa.

J-07196

Westinghouse

WESTINGHOUSE

GEARED DRIVES

Journalog

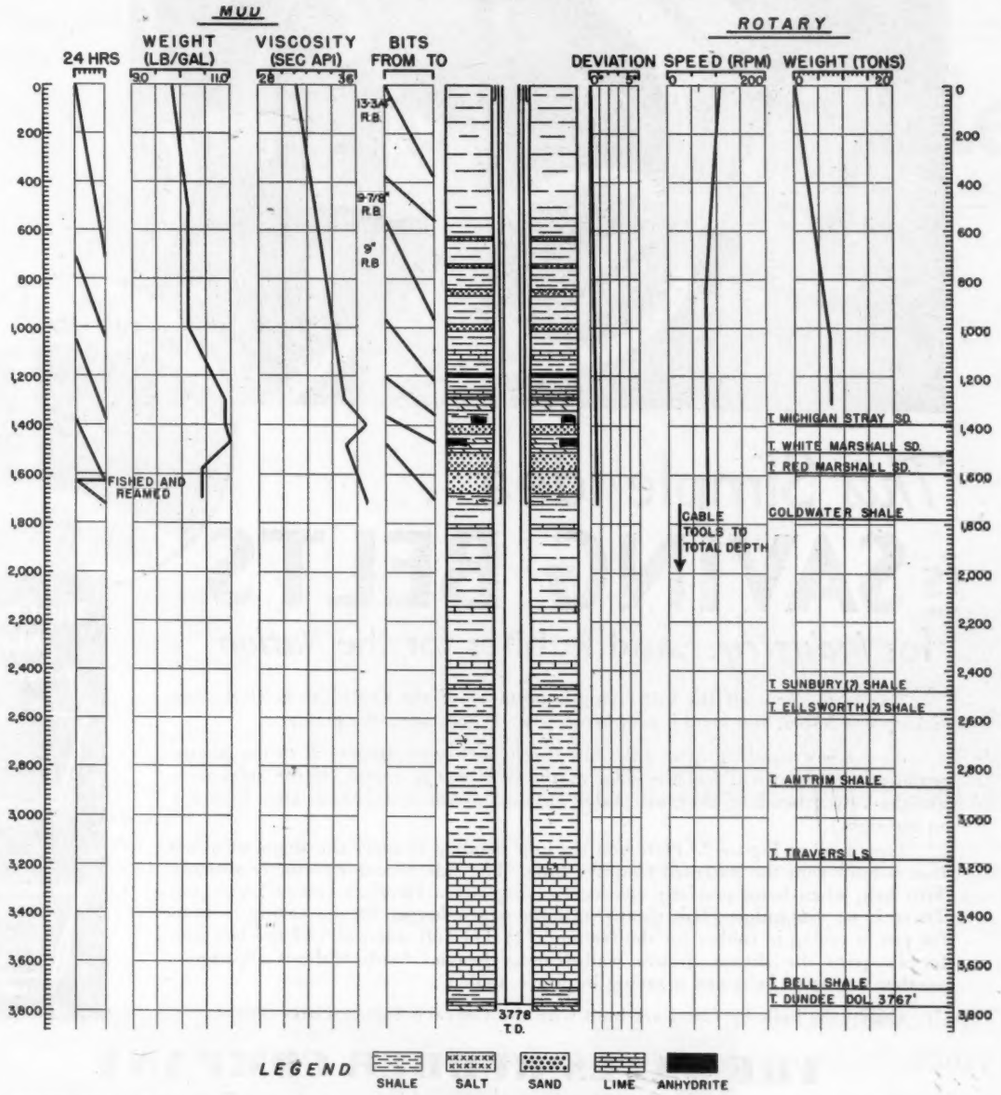
A FEATURE OF THE OIL AND GAS JOURNAL
July 2, 1942
No. 11

SUN OIL CO. 1 MARY ARNDT

N½ SW SW 23-18n-8w

COMPANY TOOLS
Contractor

Oil Discovery Evart Pool, Osceola County, Michigan



DRILLING DATA

JULY 2, 1942

Date started	3-30-42
Rigging up rotary	1 day
Drilling started	3-31-42
Drilling (rotary)	4 2/3
Fishing	1
Running casing, etc.	1
Total	6 2/3

Note: Michigan stray gas pay 1,395-1,436 ft. is being developed at present time. Evart gas pool covers approximately 2,200 acres.

CASING RECORD

Size (in.)	Weight lb./ft.	Feet	Cement	Size (in.)
10	42	61	50	13¾
7	17	1,720	200	9⅞
5 3/16	14	3,766	*10	9

*Mudded with 10 sacks.

Cable tools from 1,720 ft. to 3,778 ft.
Cable tools start 4-15-42
Completed 5- 7-42
Show oil Traverse lime 3,222-23 ft.
Gas show 3,769-74 ft.
Pay (Dundee) 3,774-78 ft.

BITS USED

Type	Number
Rock	1
Rock	1
Rock	5

PRODUCTION DATA

5-2-42—Swabbed 32 bbl.
5-3-42—Swabbed 31 bbl.
5-6-42—Acidized 1,000 gal.
5-6-42—Open flow 298 bbl. in 16 hr.
Gravity of oil, 47.1.
Well elevation, 1,080 ft.

This Simple Idea . . .
is SAVING BELTS
for *Industry*. . . and Rubber for the *Nation*

To see for yourself the belt-saving importance of the CONCAVE SIDE, just pick up *any* V-belt and bend it as it bends when it goes around a pulley.

As the belt bends, grip its sidewalls firmly with your fingers as in the photograph above. You will feel the sides of the belt *change shape*. If the sides were straight before bending, they will *bulge outward* as the belt bends. (See Figure 1 on the right).

Now look at Figure 2. Here you see how bending changes the shape of a belt that is built with the patented Concave Side. The side becomes perfectly *straight*. This belt, when bent, precisely fits its sheave groove. Here are the savings:—(1) There is no side-bulge. This means *uniform* wear—*longer* life—a saving in belts for you, a saving in rubber for the Nation. (2) The full side-width of the belt uniformly *grips* the sheave groove wall—carries heavier loads without slippage—another saving of belts and a saving in power, too!

Only belts built by Gates are built with the Concave Side, a Gates patent.

What Happens When a V-Belt Bends

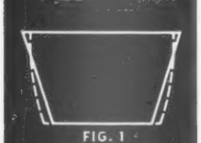


FIG. 1

FIG. 2

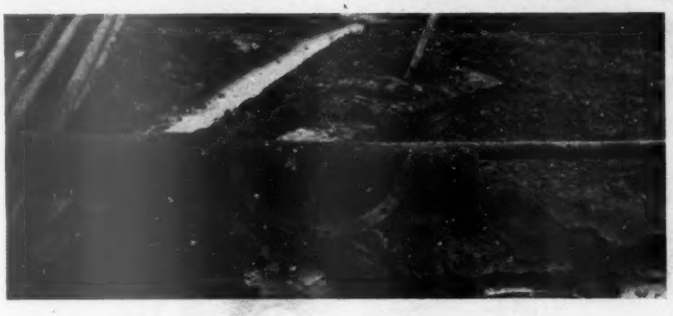
THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO V-ROPE DRIVES

Chicago, Ill. 549 West Washington
New York City 215-219 Fourth Avenue
Birmingham, Ala. 405 Liberty National Life Bldg.
Los Angeles, Cal. 2240 East Washington Blvd.
Denver, Colo. 999 South Broadway
Dallas, Tex. 2213 Griffin Street
Portland, Ore. 333 N. W. 5th Avenue
San Francisco, Cal. 2700 16th Street

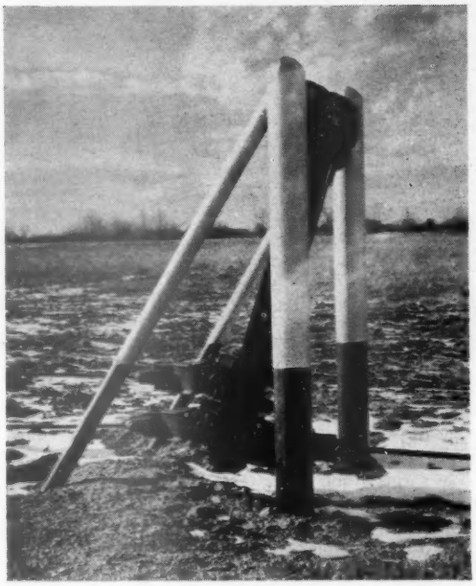
Control of Back Pressure on Steam Exhaust



Use of the engine and pump exhaust on a steam rig to heat the boiler feed water is one of the more important money-saving devices. However, the back pressure is often not sufficient to deliver enough steam to the water heater. Some type of valve must be provided in the relief exhaust so that sufficient pressure will develop. One contractor uses an adjustable butterfly valve at the end of the relief exhaust. This works like the ordinary stove damper except a half-circle track is supplied for holding the disk in the proper position. The grip of the small knob on the handle on the holes in the track is only great enough to hold it in position; any sudden pressure will allow the valve to fly open and provide the necessary relief.

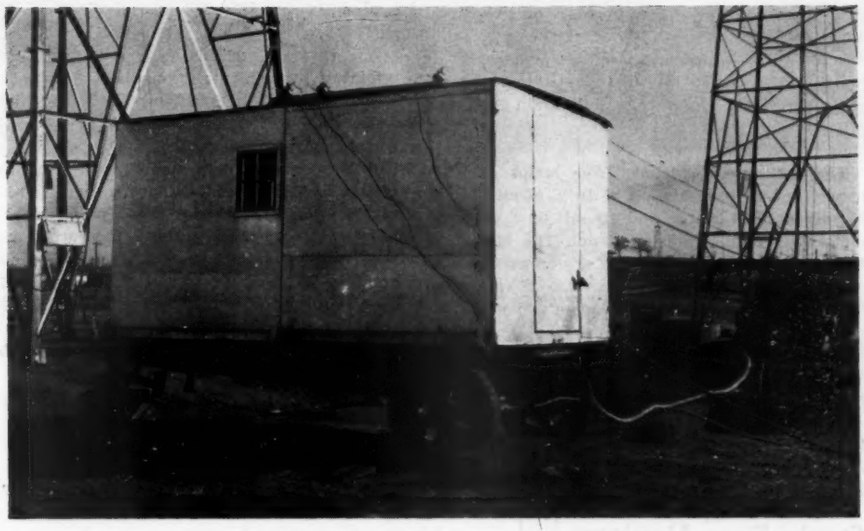
Operating Ideas

Two Wells Are Pumped With One Rod Line



By attaching another toggle to a holdup, one operator was able to pump two wells with a single rod line. A considerable saving in steel was effected. The wells were almost in line and just before the rod line reached the well nearest the power, the holdup was installed. Instead of the usual one line leading from the holdup, two lines were installed, the extra one going to the second well.

Semitrailer Houses Controls on Servicing Unit



One servicing company at Oklahoma City, Okla., uses rigs equipped with electric motors. The transformers and control equipment necessary to the operation are mounted in a covered semitrailer. A special reel is provided for the heavily insulated cable from the trailer to the servicing-unit motor.

Combination Dog House and Auxiliary Plant

Important savings in moving costs can be obtained by combining a number of small items into one large one. The accompanying picture shows how one contractor placed the usual dog house on a skid along with the auxiliary light plant and a tool box. Large doors are provided on the light plant so ample ventilation will be secured. The dog house has individual lockers for the men. The entire assembly is mounted on skids made from old drill pipe.

Progress in METALS

By W. L. NELSON

How to Identify Your Nickel Steel Scrap

NOW that alloy-steel scrap is of vital importance in our war effort, every shop operator should make an effort to segregate the valuable alloy scrap. In this connection, the following is the method of identifying nickel steel scrap which is recommended by the International Nickel Co. in its Nickel Steel Topics of March 1942:

Apply 1 or 2 drops of 1:1 nitric acid to the surface of the steel, which must be clean and scale free. After 30 seconds, treat the drop with powdered zinc oxide until an excess is present. Stir the mass thoroughly with a glass rod or pencil. Then apply the test paper impregnated with dimethylglyoxime. A pink stain indicates presence of nickel, and a brown (ferrous) stain shows its absence.

The test paper is made from strips of filter paper dipped in a solution of 10 g. of citric acid, 25 ml. distilled water and 10 ml. of 1 per cent dimethylglyoxime in isopropanol. The strips are thoroughly dried and kept in a stoppered bottle.

This method has the advantage of requiring that a minimum of liquid reagent and paraphernalia has to be transported into shops and yards. If nitric acid can be obtained in the field, the operator needs only to carry dry zinc oxide, test paper, and a glass rod.

A similar method is described on the Progress in Metals page (54) of the March 12, 1942, issue of The Oil and Gas Journal.

Sparks From Aluminum-Painted Steel

THE fact that aluminum-painted steel can be a source of sparks is worthy of the attention of many gasoline-plant operators and refiners. It would seem that the high temperature required in causing a surface to be subject to sparking would not be common in the industry, nevertheless, in rare instances it might be the cause of serious explosions. The following abstract was taken from the January 1942 issue of Metals & Alloys:

Abstract, T. S. E. Thomas, "Ignition by Sparks From Aluminum-Coated Metal Work," Foundry Trade, Vol. 65, Sept. 25, 1941.

Attention is called to the danger of heat treating after painting. It has been reported that sparks have been observed in certain industrial establishments when steam pipes and steam-heated vessels coated with aluminum paint have been struck or scraped with a tool of steel, copper, bronze, or brass. Only a light blow or scrape was found to be necessary to produce the effect.

Experimental work on the subject has brought out several points. First, the effect occurs only when the steel surface before being painted is rusty; careful preliminary cleaning eliminates the sparking. After the rusty specimen has been painted, it must be subjected to a temperature in the neighborhood of 265° F., before sparking can be attained.

No sparks could be obtained from a specimen of rusty steel, painted with an ordinary oil-vehicle aluminum paint, which had not been heated though the specimen had been kept for a year at laboratory temperature before being tested. Once the specimen has been heated after being painted, the temperature of the steel when struck has little or no effect on the character of the sparks obtained, i.e., the effect achieved by suitable heat treatment persists at normal temperature.

It was suggested that the phenomenon was a miniature thermit reaction between flakes of aluminum and the particles of rust, which are intermingled at the interface, the reaction being started by the heat generated at the point of impact between the metal tool and the iron surface. Also, with painted metal that had not been heated before trial, the vehicle in the paint acted as a lubricant—so reducing the temperature rise at the point of impact and at the same time preventing intimate contact between aluminum flakes and particles of rust, that the effect on the specimen of initial heating was the destruction of the vehicle and the consequent elimination of its preventive role.

Tests made with ordinary oil-vehicle aluminum paint, with paints containing a cellulose base, etc., are discussed. The use of aluminum paint to cover rusty steel work does not give rise to any danger from sparks, on impact with a piece of hard metal, if commercially produced paints of the types described are used, unless the metal is heated to 300° F., or upwards subsequent to being painted. However, some incorrectly made paints can be dangerous without heating of the metal work.

Metal-Working Terms

Turning and Boring

THESE are operations of cutting in which the work is rotated against the tool by means of a machine lathe, the operation of *turning* referring to the cutting of metal from the outside of the rotating part whereas *boring* refers to a similar operation by which metal is removed from the internal surfaces. Turning is conducted on "engine lathes" for general work, "machine-shop lathes" for small work, "toolmakers lathes" for precise work, and numerous other types for special operations. A machine that is used exclusively for boring operations may be referred to as a "borer."

The turning tool is mechanically guided on a slide rest in conformance with the type of work being done. A lathe is used for turning cylindrical or tapering parts, for facing radical surfaces and for such special operations as screw cutting.

Gasoline Cans for Invasion Parties

AN order for 20,000 5-gal. gasoline cans was recently placed by the U. S. Government. These cans are very similar to those used by the German Army in invading Norway, and may be used variously for gasoline, oil or water. Accounts indicate that the can, when filled to the proper level, floats near the surface of the water, attracting little attention unless they are expected, presenting only a small area as a target, and is swept by prevailing ocean currents to a predetermined general area of the coast.

Air Reduction Sales Co. and Columbian Steel Tank Co. relate that these cans were fabricated by means of oxyacetylene welding rather than other possible methods which employ electric or carbon-arc welding. Each can involves about 6 ft. of welding seam. The cans are of heavy construction so that they will not be damaged as they are dropped into the water from planes or boats, and they have a large integrally attached handle on the top. The lid is held in place by a clamp device and they are constructed of somewhat heavy galvanized sheet.

A New Zinc or Tin Coating

Abstract: R. Rimbach, "Corronizing," Mo. Rev. Am. Electroplaters' Soc., Vol. 28, July 1941. (Taken from Metals & Alloys, Nov. 1941.)

CORRONIZING is a composite coating consisting of a layer of nickel, plated on the base metal, which is followed by a layer of zinc or tin. The coating is heated at a temperature of 500° F. to 750° F. for periods up to 6 hours.

The sequence of operation in corronizing is similar to ordinary plating procedure and consists of cathodic cleaning, pickling if necessary, anodic pickling in sulfuric acid, nickel plating, zinc plating from the acid bath, and finally the heat treatment.

The coating is ductile and adheres well to the base metal. It is used for fly-screen wire, fence wire, motor parts, and in general wherever corrosion resistance is desired. For coatings of equal thickness, corronizing is said to last several times longer than galvanized coatings. Bright corronizing can also be produced

Prolonging brake lining and drum flange service life

Information Supplied by "Oil and Gas Journal"

Proper care of drilling rig brakes is now particularly important since new linings are hard to get and the brakes are the only support of the entire drill string while going into the hole.

Brake lining abuse results in severe, needless wear on drum flanges, necessitating repairs or replacement. In new rigs the drum flanges are concentric with the shaft, and will remain so with good maintenance. Whenever drum shaft wobble develops, however, brake wear increases rapidly and it is important that the condition be corrected promptly.

Brake flange scoring should be removed by turning down the flanges, or by rebuilding and grinding or machining to their original condition. The most common cause of excessive brake wear is running the pipe in the hole too fast. The heat generated in stopping the load then becomes enormous, and is transferred to the drums and linings.

Still another source of serious brake flange damage is that of turning cold water on the brakes when they are hot. This practice has been known to result in a complete explosion of the brake flanges. The water should be turned on the brakes before starting into the hole.

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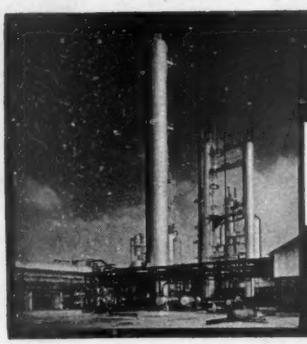
Climax Molybdenum Company
500 Fifth Avenue, New York City

MOLY



REFINERY ACTIVITY AND EXPANSION

Continental Refining Co. Reorganized, May Expand

OIL CITY, Pa.—The Continental Refining Co., Oil City, emerged from receivership and passed into the hands of several veteran Pennsylvania oil men last week, assuring continued operation of a concern which has been in business since 1885.

The new management is headed by A. B. Weingard, Butler, Pa., president, who has been connected with various phases of the Pennsylvania oil industry for 25 years. Todd K. Glenn, Leechburg, Pa., is vice president of the reorganized company, and Benjamin G. McFate, Oil City, is secretary and treasurer. Another member of the group of new owners is Wenman A. Hicks, Pittsburgh, Pa., who has been made a member of the board.

William J. Anderton, employed by Continental Refining Co., for the past 16 years and receiver and general manager during the 6½ years of operation under receivership, will continue with the reorganized firm.

The new management announced that extensive changes and additions would be made to the refinery although details of the contemplated construction program were not disclosed. The refinery has a rated capacity of 900 bbl. of crude daily and 200-bbl. cracking unit. Lubricating oil and wax are produced at the refinery in addition to the conventional range of petroleum products from skimming and cracking operations.

Mr. Weingard, the new president, began his career in the oil industry in 1916 when he became manager of the Advance Oil Co., Reno, Pa. After serving 2 years in the Army during the first World War, Mr. Weingard, in association with Wayne K. Glenn, now deceased, and others, organized the Pennsylvania Oil & Refining Co., Oil City. Pennsylvania Oil & Refining was merged with Pennsylvania Refining Co., in 1924 and the continuing company, with Mr. Weingard remained, consolidated with American Oil Works, Titusville, Pa.

Mr. Weingard is currently a director of the Pennsylvania Refining Co., the A-Penn Corp., Penn-Champ Laboratories, all of Butler; the Penn-Glenn Oil Works at Leechburg, and the Mid-Penn Refining Co., Oil City.

Mr. Glenn was affiliated with the old Empire Oil Works, Reno, which is now the Wolf's Head Refining Co., until 1927 when he and others organized the Penn-Glenn Oil Works.

Canada Waives Duty on Tar Sand Mining Supplies

OTTAWA, Ont.—The 1942 Canadian budget provides for duty-free admission of equipment used in connection with the separation of bituminous sands.

This concession indicates that business interests are preparing to expand the mining of Athabaska oil sands along the McKenzie River which are conceded to contain the largest known undeveloped petroleum reserve in North America.

The Athabaska tar sands contain between 100 and 250 billion barrels of oil. Mining the sand and extraction of oil therefrom has been carried on at an experimental rate for several years. Specific provision for waiving import duty on additional machinery required to expand the sand-mining and petroleum-extraction operation probably indicates an expansion of this scale to commercial proportions.

Synthetic-Rubber Fuel Tanks Have Broad Application

BALTIMORE, Md.—Synthetic-rubber fuel tanks which may turn railroad box and gondola cars into tank cars, wooden barges and boats into tankers and allow overland trucks to carry gasoline and oil supplies may go far toward solving the critical problem of oil transportation.

The tanks are a development of the Glenn L. Martin Co., manufacturer of bombers. The transport tanks are an adaptation of the cells the company developed nearly 5 years ago as airplane fuel tanks.

Experimental cells have been manufactured and the Pennsylvania Railroad will conduct, in the immediate future, service tests in a box car which will be fitted out for the purpose at its shops. The use of the cells in wooden barges was advanced before the Senate Interstate Commerce Subcommittee in May by Ernest Holzborn, director of Intercoastal Transportation.

A feature of the tanks is that, after carrying fuel to its destination, they may be rolled up into compact packages and expressed back, making the car or barge or other conveyance available for return freight, instead of returning empty.

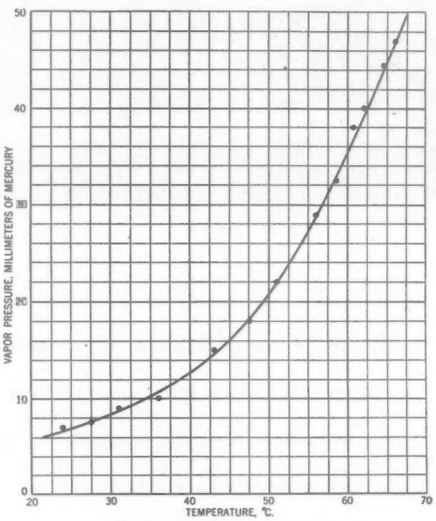
The need for additional transportation capacity, overland and by the inland waterways, to answer the shortage caused by shipping losses to Axis submarines, is behind development of the synthetic-rubber cells.

In its application to petroleum transport, the tanks show promise in using less-than-carload space that otherwise might remain empty in transit.

Long-time sloshing and abrasion tests have been conducted to prove the durability of the cells. No appreciable wear has resulted. Service presents no problems beyond the ability to apply a cold patch in case of a rupture of the material.

Styrene Data Subject of Information Bulletin

Because of the increased production and handling of styrene for the manufacture of synthetic rubber, the U. S. Bureau of Mines has recently released a bulletin on its inflammability and ignition. The paper is R.I. 3630 and is titled "Limits of Inflammability and Ignition Temperature of Styrene in Air," by G. W. Jones, G. S. Scott, and W. E. Miller, explosives division, central experiment station, Bureau of Mines, Pittsburgh, Pa.



Vapor pressure of styrene

The limits of inflammility of styrene by volume in dry air at laboratory pressures and temperatures (29.3° to 65.2° C.) are 1.1 per cent for the lower limit and 6.1 per cent for the upper limit. All mixtures falling within these limits are inflammable. The styrene has an ignition temperature of 490° C. in air and 450° C. in oxygen.

Vapor pressure of styrene was determined and is shown in the accompanying graph. The limits of inflammability of styrene in air were calculated as follows:

The vapor pressure of styrene at 29.3° C. (8.2 mm. Hg) the temperature at which the lower limit of inflammability is reached was obtained from the curve. The total pressure of the styrene-air mixture at the time the tests were made was 476 mm. Hg. The percentage of styrene in the lower-limit mixture equals the vapor at the limiting temperature multiplied by 100 and divided by the total pressure of the mixture, or the lower limit of inflammability $= \frac{8.2 \times 100}{746} = 1.1$ per cent. The upper limit of inflammability, similarly $= \frac{45.5 \times 100}{746} = 6.1$ per cent.

You're "Safe" when YOU CARRY A 90-UL ECOLITE

DON'T WAIT—GET THIS MARVELOUS NEW SAFETY LANTERN WITH BROKEN BULB EJECTOR RIGHT AWAY.

SAFE in HAZARDOUS PLACES

TESTED AND RECOMMENDED BY UNDERWRITERS' LABORATORIES

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Sketches of Plant Operators . . .

GROVER C. ANDERSON, a director and superintendent of refinery operations for El Dorado Refining Co., El Dorado, Kans., has directed manufacturing operations for 16 years. He was appointed superintendent 2 years after starting with the company as a treater.

As superintendent, Mr. Anderson is in charge of every department of refining from the time crude oil is received until the finished products are ready for shipment. He is the man responsible for keeping the plant at El Dorado in operation 24 hours a day, 7 days a week.

New construction and rebuilding come under the superintendent's direction in the smaller organizations. His background of practical experience in practically every stage of refining is of unestimable value in filling the position he has held for the past 16 years.

Mr. Anderson joined El Dorado Refining Co. 5 years after he left his home state, Indiana, and had gone to Kansas to do refinery work. His rise from treater to more responsible functions at the refinery was rapid, culminating in appointment to the superintendency in 1926. Six years after becoming superintendent, he was elected a member of the board and has been a director since that time.

His favorite recreation is hunting and his hobby is the collection of firearms. Two years ago, when he managed to take time off from his ramified functions to go on a big game hunt, he bagged an elk with one shot. This won for him his nickname of "One Shot" Anderson.

Graduated from the University of Akron in 1922 with a degree in rubber chemistry, Mr. Eckert went to work as a development compounder with the Rubber Service Laboratories, Akron, Ohio, now the rubber-service department of Monsanto. He went into operations work at the Nitro plant in 1926 and progressed through the ranks of plant supervisor and operating superintendent before becoming plant manager in 1938.

Dr. Comstock received his bachelor's degree in chemical engineering from Yale University in 1932 and the doctorate in 1935. He joined the Merrimac division of Monsanto in 1935 as a member of the special engineering service. In 1936 he was made an assistant department superintendent at the Everett plant. The appointments were effective July 1.

Butadiene Placed Under Complete Priority Control

WASHINGTON, D. C.—The War Production Board has placed butadiene under complete allocation through Order M-178, effective July 1.

Except for producers who make less than 5 tons of butadiene per month, all manufacturers seeking to make deliveries, and all persons desiring deliveries, of butadiene are required to make application to the director of industry operations of WPB, citing M-178 as reference. It is requested that applications be made on Form PD-33, which covers the production and shipment of all chemicals used in the manufacture of synthetic rubber. Sales of butadiene may be made only as allocated by the WPB.

Text of the order follows:

Section 1285.1—General Preference Order M-178.

(*a*) *Definitions.*—For the purpose of this order: (1) "Producer" means any person engaged in the production of butadiene and includes any person who has butadiene produced for him pursuant to toll agreement, but does not include any person producing less than 5 tons of butadiene a month.

(*b*) *Restrictions on use and delivery of butadiene.*—On and after July 1, 1942, no producer shall use or deliver butadiene except as specifically authorized or directed by the director of industry operations; and no person shall accept delivery of butadiene if said delivery would be made in violation hereof.

(*c*) *Applications for use or delivery of butadiene.*—Producers seeking to use or deliver and persons seeking delivery of butadiene (the use, delivery or acceptance of delivery of which is forbidden by the provisions of Paragraph *b* hereof) shall make application therefor to the Director of Industry Operations, War Production Board, Attention Chemicals Branch, Reference M-178.

(*d*) *Reports.*—Reports shall be made at such times and on such forms as shall be prescribed therefor by the Chemicals Branch, War Production Board.

(*e*) *Notification of customers.*—Producers of butadiene shall, as soon as practicable, notify each of their regular customers of the requirements of this order but the failure to give such notice shall not excuse any such person from complying with the terms thereof.

(*f*) *Applicability of Priorities Regulation 1.*—This order and all transactions affected thereby are subject to the provisions of Priorities Regulation 1 (Part 944), as amended from time to time, except to the extent that any provisions hereof may be inconsistent therewith, in which case the provision of this order shall govern.

(*g*) *Violations.*—Any person who wilfully violates any provision of this order, or who, in connection with this order, wilfully conceals a material fact or furnishes false information to any department or agency of the United States is guilty of a crime, and upon conviction may be punished by fine or imprisonment. In addition, any such person may be prohibited from making or obtaining further deliveries of, or from processing or using, material under priority control and may be deprived of priorities assistance.

Issued this 27th day of June 1942.

Oil Industry Employs 6,000 Research Workers

NEW YORK.—The number of research workers in the petroleum industry is now about 6,000, of which about 45 per cent are highly trained scientific men, Dr. Benjamin T. Brooks, consulting chemist of New York City, says in a report to the American Chemical Society on "Petroleum Research and the War." There are 563 research workers for every 10,000 wage earners in the refining branch of the business, or almost twice the ratio in the chemical industry.

"The ability to satisfy these new war needs is due to the fact that since 1912 the petroleum industry has greatly increased its staff of trained research and engineering personnel as well as production," Dr. Brooks said.

Monsanto Shifts Key Men To Texas City Rubber Plant

ST. LOUIS, Mo.—Shifting of several key men in the research and operating departments of Monsanto Chemical Co. preparatory to the beginning of operations at the synthetic-rubber raw-material plant being constructed by the company for the Rubber Reserve Co. at Texas City, Tex., was announced last week by Osborne Bezanson, vice president and general manager of the Texas division of Monsanto.

Herman K. Eckert, plant manager of the Nitro, W. Va., plant of the organic chemicals division of Monsanto, has been appointed plant manager at Texas City.

Dr. Charles S. Comstock of the production staff of the Merrimac division at Everett, Mass., has been appointed production superintendent.

G. A. WELDING Shop Notes

NO "BLUEPRINT BLUES"

Before any order goes into the shops of the General American Plate and Welding Division, it must first visit the Engineering Department. Here a technically trained staff details each operation, either from customer's rough sketches or finished drawings. All shop procedure is scheduled for rapid and accurate execution. There are no "blueprint blues" at Sharon—because each line of every diagram is checked by men who know steel and know fabrication through years of experience.

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GENERAL AMERICAN TRANSPORTATION CORPORATION
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Have What It Takes To Deliver Under Most Adverse Conditions

Built into every "CLEVELAND" is a big plus value that enables it to deliver master performance under the most adverse conditions, and pile up real savings when the going gets tough.

"CLEVELANDS" deliver this superior performance because in them correct design joins hands with "tops" in quality.

With Clevelands every operation incidental to mechanical ditching is speeded up — waste motion eliminated — and precious minutes saved. You can't miss when you pick "CLEVELANDS" for your ditching jobs. Write for specifications and details.

THE CLEVELAND TRENCHER CO.
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POSITIVE and PERMANENT
PIPE PROTECTION

CONSERVE STEEL
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Pipe-Line Activity

Plantation Doubling Pump Capacity To Accommodate Texas Extension

FACILITIES are now being installed on the main system of Plantation Pipe Line Co.'s products line from Baton Rouge, La., to Greensboro, N. C., to handle 50 per cent greater throughput in order to accommodate additional traffic from the Beaumont, Tex., extension.

Twenty-five additional explosion-resisting electric motors are being added to the 39 now installed at the 21 stations, increasing the pumping power to 51,000 hp. These data were revealed last week in Chicago, Ill., before the American Institute of Electrical Engineers' fifty-eighth national summer convention by M. A. Hyde, petroleum engineer for the Westinghouse Electric & Manufacturing Co., and H. B. Britton, chief engineer of the Plantation company.

"The electric motors in the present stations now produce a total of 23,000 hp.," Mr. Hyde said. "They drive centrifugal pumps equipped with bladed disk-like impellers which revolve 3,600 times a minute. At this speed the impellers create pressure of 900 lb. per sq. in., or more than 100,000 lb. for the 12-in. pipe, to force petroleum products through the line at about 5 miles an hour. The main motors are 600 and 900 hp."

Rumors were current this week that Bayou Pipe Line Co. had been organized by several Texas refiners who will supply products for the southern and western extension of the Plantation system to Beaumont and that arrangements had been made to reclaim the necessary pipe from one of the crude carriers now transporting West Texas oil to the Gulf Coast.

Dow Chemical Plant Served With 85 Miles of New Lines

HOUSTON, Tex.—Latex Construction Co., Houston, Tex., has completed laying approximately 85 miles of 8, 12, and 14-in. line in conjunction with the expansion program at the Dow Chemical Co. plant at Velasco, Tex. This project consisted of a gas line from the Old Ocean field, Brazoria County, and additional water and chlorine lines at the plant.

WPB Asked to Approve Gas Line For Missouri and Kansas

INDEPENDENCE, Kans. — Paul R. Johnson, president of Union Gas System, Inc., announced last week that plans have been filed with the Office of Petroleum Coordinator and the War Production Board proposing a new gas pipe line across Kansas, located in a manner which will substantially benefit all natural-gas users in Kansas and western Missouri, including all industrial localities.

"Western Missouri and Kansas east of Wichita and Topeka, but including Wichita and Topeka," according to Mr. Johnson, "produce less than 7 per cent of the gas consumed within this territory. Peacetime demands of users in this territory have grown each year for the 10 years preceding Pearl Harbor, and now war plants require constantly greater supplies of fuels which with civilian requirements are substantially in excess of the capacity of pipe lines now serving this territory. A much greater supply of gas must, therefore, be provided to insure positive and successful performance of war-production schedules."

Contract Awarded for 8 Miles Of 4-in. Products Pipe Line

HOUSTON, Tex.—J. S. Abercrombie has awarded contract to the Latex Construction Co., Houston, Tex., for a 4-in. products line from the Old Ocean field, Brazoria County, Texas, to loading racks at Sweeney, Tex., a distance of about 8 miles.

Montana-Dakota Utilities Completes High-Pressure Line

The Montana-Dakota Utilities Co. has completed and put into operation its new 25-mile 6-in.

EQUAL DISTRIBUTION OF PRESSURE

UNIBOLT Couplings with their three interlocking shelves, or 3-point suspension, employ a proven principle that assures equal distribution of pressure on the seal ring.

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Pipe-Line Personalities . . . Tracy C. Wilmoth

TRACY C. WILMOTH, pipe-line superintendent, Dallas district, United Gas Pipe Line Co., served as chief inspector supervising part of the work carried on in connection with the laying of the company's 216-mile Lirette-Mobile line. This line had unusual features since it included a triple submarine crossing of the Mississippi River as well as a 25.9-mile section laid across the bottom of Lake Pontchartrain.

Mr. Wilmoth attended schools in his home town of Hillsboro, Tex., before he attended Austin College at Sherman, Tex., where he spent a year. He completed his college career with 3 years at Southern Methodist University, Dallas, Tex., and was graduated in 1928. While at the university he was a member of the football team.

After graduation he entered the employ of a natural-gas pipe-line organization operated by Magnolia interests, with which he remained for 2 years. In the active pipe-line year of 1930 he was engaged in construction work for the laying of 24-in. pipe from Kansas to Sioux City, Iowa. In 1931 he worked on a line across the Rocky Mountains near Helena, Mont. During 1931 and 1932 he installed distribution systems serving a number of communities in Minnesota and Iowa.

For approximately 11 years he has been with United Gas Pipe Line Co. His first work with this organization was in the San Marcos, Tex., area in 1933. The following year he was transferred to southwestern Louisiana and in 1935 he became a subforeman. In 1936 he was promoted to handle the responsibilities of section foreman. Nearly 2 years ago he was transferred to the Shreveport district where he served as field and section foreman until July 1941 when he was loaned to the company's engineering department to perform the duties of chief inspector of crossings of the Lirette-Mobile line at the Mississippi River and Lake Pontchartrain. Last November he was promoted to his present position. He is married and has two children.

high-pressure line connecting the Texas Co. gas wells in the Cut Bank field with the line to Great Falls, Mont. A connection also was made with the Big West Oil Co. line to take surplus gas from the wells it recently completed in the district between the Cut Bank and Kevin-Sunburst fields.

Ten-Mile Line Protested In Southern Wisconsin

MADISON, Wis.—Suit has been filed in Dane County Circuit Court here asking vacation of a Wisconsin Public Service Commission order authorizing the Wisconsin Southern Gas Co. to build a 10-mile natural-gas pipe line from Lake Geneva to the Illinois State line.

The Wisconsin Coal Bureau, Milwaukee, and the Upper Michigan Fuel Dealers Association, competitors of Wisconsin Southern and plaintiffs in the action, allege that the commission overstepped its authority and maintain authorization is required from the Federal Power Commission.

Ground Survey Under Way For Emergency Pipe Line

WASHINGTON, D. C.—The ground survey to determine the exact route of the world's largest oil pipe line—the 24-inch Texas-to-Illinois line which will provide partial relief for the East Coast shortage area next winter—was under way this week.

Coordinator Ickes announced that the government-owned nonprofit, common carrier line would be built for the Government by War Emergency Pipe Line, Inc., an organization of 11 companies which supply and distribute petroleum and petroleum products along the Atlantic seaboard.

The ground survey parties, according to Deputy Petroleum Coordinator Ralph K. Davies, entered the field near Longview, Tex., to commence staking out the route. The survey is being made by the Monroe, La., firm of Huey & Cage. It will take about 30 days to complete.

It should be possible before that, however, to commence the actual laying of pipe, Mr. Davies said. He pointed out that an order for the 550 miles of 24-in. line pipe required had been placed several days ago with the National Tube Co. of Pittsburgh, which plans drawing the tubing very shortly. National Tube, he said, has given assurances that it can deliver 140 miles of pipe during July.

Agreement on the organization which will build the line for the Government was reached at a meeting in New York attended by representatives of the interested companies.

Magnolia-Gulf, Panhandle-To-Ranger Line Being Dug Up

FORT WORTH, Tex.—Removal of 280 miles of 8⅛-in. pipe from Hutchinson County, Texas Panhandle, to Ranger, Tex., was under way last week. The pipe, from a line jointly owned by the Magnolia and Gulf pipe line companies, will be used in the construction of other lines. Magnolia had 170 miles of the pipe, Gulf had the remaining 110 miles.

Part of the pipe from the Magnolia-Gulf system between the Texas Panhandle and Ranger, Tex., will be used, according to reports here, in construction of a products line from East Texas to Helena, Ark., where petroleum will be discharged into barges for transit up the Mississippi and Ohio rivers to the East Coast district. Products would originate in the East Texas and Gulf Coast district. The southern portion of the project through which Gulf Coast refinery products would reach the segment to be built from East Texas to Helena involves reversal of an existing crude line.

Atlantic Completing Line From Louisiana to Atreco

HOUSTON, Tex.—Atlantic Pipe Line Co.'s 63 miles of 8-in. oil line from the Neale field, Beauregard Parish, Louisiana, to the company's refinery at Atreco in Jefferson County, Texas, was scheduled to be completed the first of this week. This is the first pipe-line outlet for the field. The line was laid by the Latex Construction Co., Houston, Tex.

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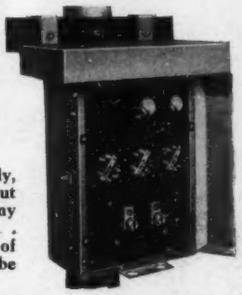

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Repeated investigations of the petroleum industry, culminating in last year's Cole committee report, have shown that it has been able to maintain a balance among the various phases of its activity. Enough oil is produced to meet demands and transportation facilities under normal conditions put the oil where it is needed. Drilling keeps pace with requirements and in recent years there has been an available surplus which has permitted the introduction of sound engineering principles in the exploitation of oil fields.

One of the elements which permitted this equilibrium was a considerable fluidity in the transportation system. This was obtained by the use of tankers between the Gulf and Atlantic seaboards and tank cars between flush fields and inland refineries. New flush production in Illinois meant the construction of many miles of new pipe lines but the last 2 years have seen a decline of 50 per cent from that state's peak production and the pipe lines are still operating to capacity. The decline in Illinois' production has been partially offset by the rise of Mississippi, notably Tinsley, and more recently refiners who formerly used Illinois crude have begun purchasing oil from southern Arkansas.

Disruption of the tanker service has tended to freeze tank-car transportation. The demand for oil on the East Coast has been met to as great an extent as possible by the transportation of oil by tank car while Midwest refiners are largely dependent on the nearest fields. If production from these areas holds up then conditions will get no worse. However, the nearby areas are not holding up. Illinois' production has dropped from 420,000 bbl. last November to around 275,000 bbl. Tinsley's output has dropped from 99,000 bbl. in the middle of April to 85,000 bbl. and no upturn is probable. From the standpoint of the transportation system the new pipe line from East Texas to southern Illinois is equivalent to the discovery of a new major field in Illinois. The proposed pipe line from Tinsley to Charleston and Savannah will tap a declining field and will require an extension westward if it is long to continue in use.

The picture is complicated by the increasing necessity of using steel in production in those areas where the greatest quantity of oil can be found with a minimum use of steel. This is in those states which are now prorated heavily because of lack of transportation facilities. This year's discoveries in Texas and the continual extension of Kansas' fields indicate that those are the states in which development should take place. Wyoming and New Mexico, still more remote, have much greater capacity to produce than they have outlets for their crude. Continued overproduction of the nearby fields which are declining may compel additional adjustments of the transportation system continually through the war period with a drastic reorganization afterwards. It is difficult to see how additional lines in the southeastern states will help solve the problems of the industry.

LOUISIANA GULF COAST: A wildcat located offshore from Iberia Parish is being tested. Showings are reported in the Wilcox on the flank of Pine Prairie (p. 64).

TEXAS GULF COAST: The wildcat between North Markham and Van Vleck in Matagorda County is being tested. If successful, it will probably be on a separate structure rather than forming a link between the two fields. Extensions are indicated for Withers, South Mauritz and Harmon (p. 64).

ILLINOIS: A fair McClosky producer east of Dundas in Richland County has been completed as a pool opener. A new pool is in prospect near Cook's Mills in Coles County (p. 65).

KANSAS: A new gas pay, the Elgin sand, has been opened up in the Whelan pool, Barber County, and production has been found in the Mississippi lime in southeastern Greenwood County (p. 67).

WEST TEXAS: Abell has been extended ½ mile south by a good Simpson producer. Shell's Ellenburger discovery in Ward County is reported to be a very large well but official data are lacking. Drilling in Andrews County is accelerating (p. 58).

LOUISIANA-ARKANSAS: A new Wilcox sand pool is indicated in Winn Parish and the Ferriday test, which made gas distillate in the Tuscaloosa has been plugged back and completed in the Wilcox to open another new field (p. 69).

EAST TEXAS: Active drilling campaigns are under way near the Club Lake, Hunt County, and Black Oak, Wood County, discoveries (p. 56).

INDIANA: A second test near Evansville is showing oil in the Waltersburg (p. 63).

SOUTHWEST TEXAS: Three sands are to be tested in De Witt County's prospective Wilcox sand pool opener (p. 59).

CALIFORNIA: Two tests at Buena Park are running low and the sands are thin (p. 62).

WYOMING: Three good wells at Oregon Basin add considerably to the black oil potentialities of that field (p. 68).

ALBERTA: After a 7-month shutdown following a fire, Abasand Oils has resumed operations in its tar sands property at McMurray. Production tests are starting on a reported discovery at Ram River northwest of Calgary (p. 69).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended June 27, 1942)

	Oil	Gas	Dry	Total	Footage	Tl. comp. to date 1942	Tl. comp. to date 1941
N. Y., Pa., and W. Va.	46	9	6	61	112,240	1,788	2,638
Ohio	5	8	5	18	52,589	489	774
Indiana	0	0	4	4	6,372	176	223
Kentucky	1	1	0	2	5,021	168	333
Illinois	17	1	26	44	108,564	829	1,619
Michigan	6	2	10	18	48,604	348	413
Kansas	13	1	10	24	77,017	747	939
Nebraska	0	0	0	0	0	20	45
Missouri, Iowa	0	0	0	0	0	9	14
Oklahoma	12	0	14	26	81,449	651	751
Texas:							
North Central Texas	5	1	16	22	58,508	629	1,419
West Texas	19	1	6	26	115,834	811	1,003
Texas Panhandle	2	0	0	2	5,830	218	260
East Texas	1	0	2	3	20,286	202	563
Texas Gulf Coast	4	1	5	10	58,976	420	534
Southwest Texas	9	0	7	16	89,611	656	869
Total Texas	40	3	36	79	348,945	2,936	4,648
North Louisiana	4	0	4	8	33,784	248	294
Louisiana Gulf Coast	3	0	3	6	62,649	281	439
Total Louisiana	7	0	7	14	96,433	529	733
Arkansas	1	0	0	1	5,875	75	89
Mississippi and Southeast	0	0	2	2	12,685	43	129
Montana	1	0	0	1	2,969	81	122
Wyoming	3	0	0	3	10,307	47	68
Colorado, Utah	0	0	0	0	0	5	19
New Mexico	2	0	1	3	6,218	144	233
California	10	0	0	10	41,922	392	514
Total United States	164	25	121	310	1,017,210	9,477	14,299
Total previous week	183	37	102	322			
Week ended June 28, 1941	431	50	153	634			

LOS ANGELES BASIN REVIEW

The fourth of a series of reviews of petroliferous areas in the United States begins on the page following. Reviews covering Illinois, East Texas, and South Central Texas have already been published and a discussion of the recent discoveries and the producing fields of Wyoming is scheduled to appear in an early issue.

This is A

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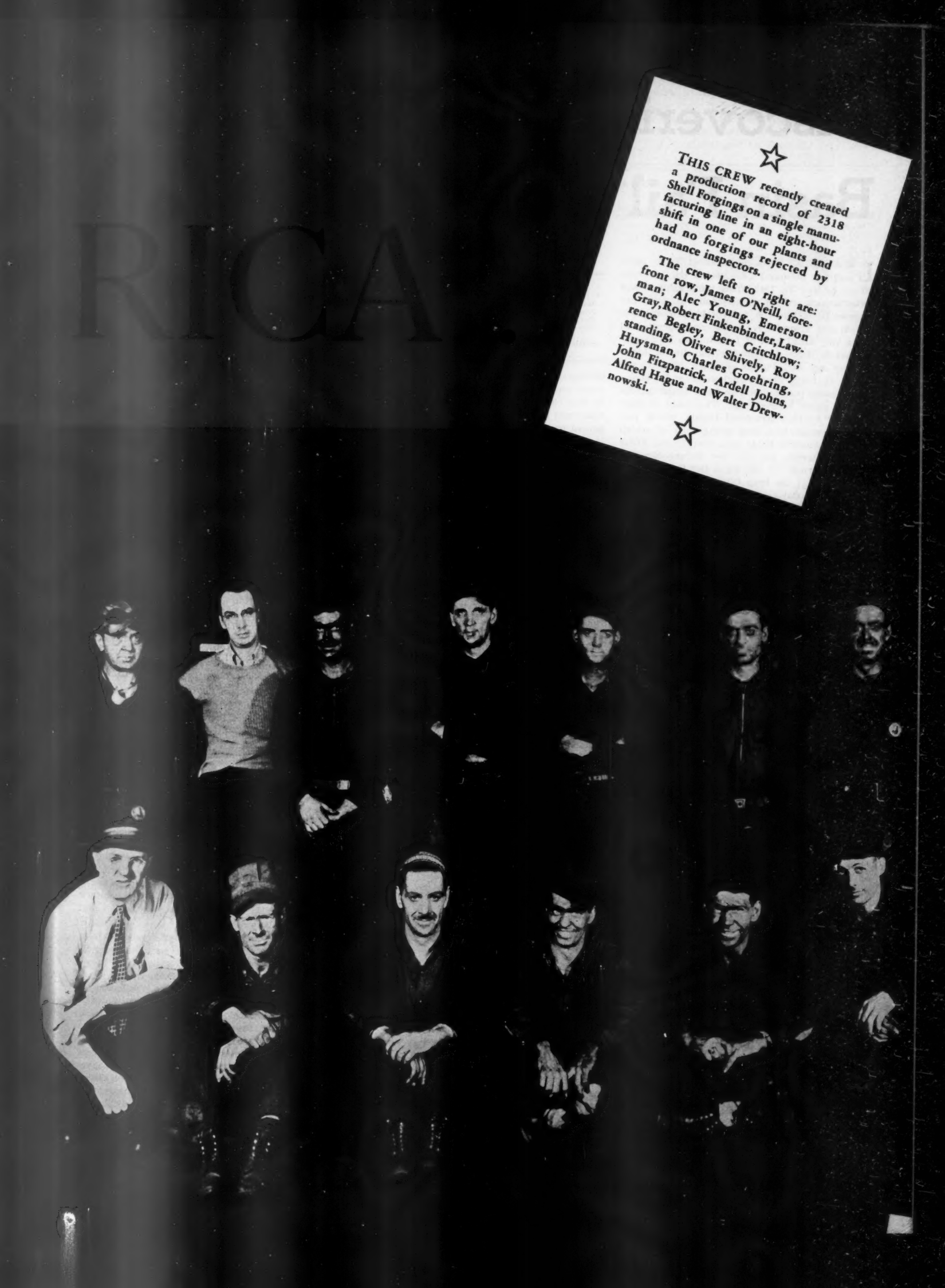


THIS CREW recently created a production record of 2318 Shell Forgings on a single manufacturing line in an eight-hour shift in one of our plants and had no forgings rejected by ordnance inspectors.

The crew left to right are: front row, James O'Neill, foreman; Alec Young, Emerson Gray, Robert Finkenbinder, Lawrence Begley, Bert Critchlow; standing, Oliver Shively, Roy Huysman, Charles Goehring, John Fitzpatrick, Ardell Johns, Alfred Hague and Walter Drewnowski.

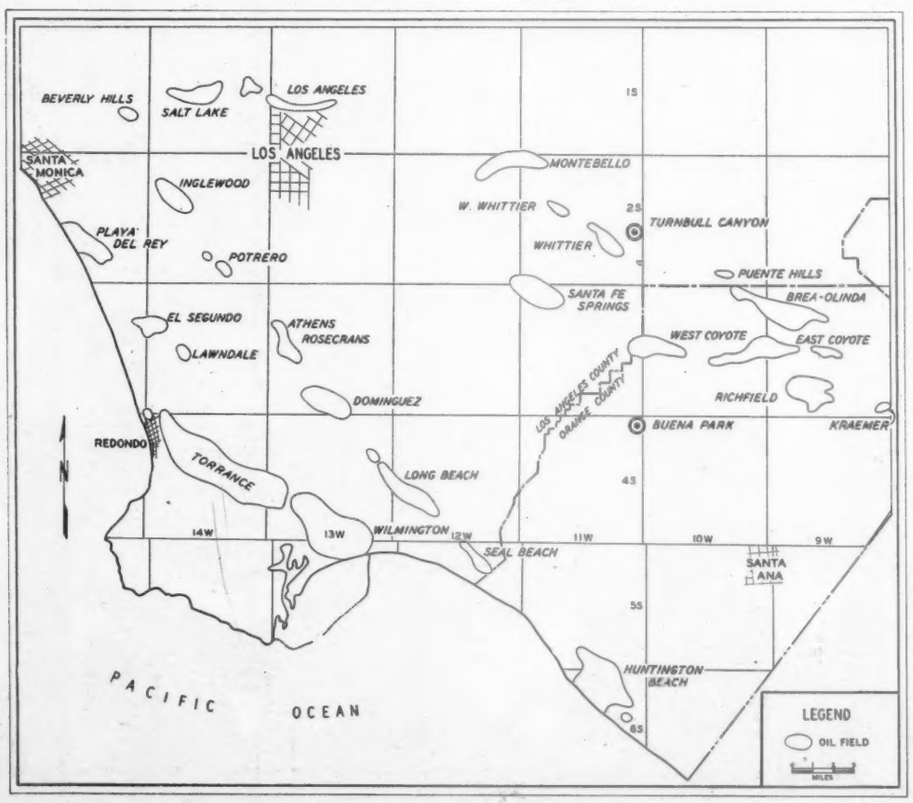
Discoveries in Los Angeles Basin Fail to Maintain Reserves

By L. P. STOCKMAN

LOS ANGELES Basin covers about 750 sq. miles and has produced 2,834,508,909 bbl. of crude oil up to May 31, 1942. This remarkable record reflects thick and highly permeable sands in Los Angeles Basin Pliocene, a favorable Miocene deposition and a productive schist-conglomerate. All but a very small part of Los Angeles Basin production is derived from the Repetto of lower Pliocene age and Puente of upper Miocene age except at Long Beach, Inglewood and Potrero where some production has been found in the Pico of upper Pliocene age. The basin is characterized by four structural trends, which parallel the coast line, and along each of which several productive fields have been found. These structural trends are (1) the Beverly-Newport line of shearing; (2) the Playa Del Rey-Wilmington trend; (3) the Brea Olinda-Montebello trend and (4) the Coyote Hills uplift. The Beverly-Newport line contains eight productive fields and from north to south in order there are Beverly Hills, Inglewood, Potrero, Rosecrans, Dominguez, Long Beach, Seal Beach and Huntington Beach. The Playa Del Rey trend contains five fields and from north to south these are Playa Del Rey, El Segundo, Lawndale, Torrance and Wilmington. The Brea Olinda-Montebello trend includes five productive areas and from west to east these are Montebello, Whittier, Turnbull Canyon, Puente Hills and Brea Olinda. The Coyote Hills uplift contains five productive fields and from west to east there are Santa Fe Springs, West Coyote, Buena Park, East Coyote and Richfield. Several fields in Los Angeles Basin contain one or more productive areas with intervening saddles but these are generally recognized as single fields. In this classification, the Athens section of the Rosecrans field is generally recognized as a component part of the Rosecrans field although there is a saddle between the two productive areas. A similar situation exists at Seal Beach where the Alamitos Heights section is separated from the main field by a saddle. In the same way Rideout Heights is classified with Whittier and Puente is grouped many times with Brea Olinda. Technically each is a separate producing area as the saddle forms perfect closure although in most cases the same zones exist in both districts and the saddle reflects faulting.

LOS ANGELES BASIN DISCOVERY, 1942
Buena Park field, Orange County.
Discovery well—Texas 1 Spencer, 1-45-11w.
Date—March 7.
Pay—Spencer zone, Repetto, Pliocene 8,900-32 ft., T.D. 9,660 ft., P.B. 8,980 ft.
Initial production—Flowed 90 bbl. 21.1° crude.

Los Angeles Basin is that area in Los Angeles and Orange counties south of the Santa Monica Mountains and the San Fernando Valley, north of Newport and west of Brea Olinda and Richfield to the shore line and including the tideland accumulations at Wilmington, Huntington Beach and Playa Del Rey. In accordance with this interpretation, the Aliso Canyon, Del Valle, Newhall Potrero, Oak Canyon and San Martinez fields, although in northwestern Los Angeles County, are included in the Coastal district group along with other productive fields in Ventura and Santa Barbara counties. This has been done for simplification and because the formations in the Newhall-Castaic region are quite similar with conditions prevailing in the Ventura County group. The five fields mentioned above as being located on the Playa Del Rey trend are generally recognized as being in Los Angeles Basin and yet this group of fields, located along the shore line west of the Beverly-Newport line of shearing, is in reality a structural part of the so-called Catalina uplift. The fields in question are Playa Del Rey, El Segundo, Lawndale, Torrance and Wilmington. Wilmington is one of the most productive fields in the basin and may exceed the ultimate production of Long Beach which is another remarkable field.



Oil-field map, Los Angeles Basin, California

Characteristics of Basin

The San Joaquin and Los Angeles basins are quite similar in many respects and there are a number of outstanding conditions that are characteristic of both basins. In both areas (1) many fields are located around the rim of the basin; (2) accumulations follow well-defined lines of folding and faulting and (3) the prevailing trend is from northwest to southeast although the axes of the various fields may be at an angle to the general trend and the fields located en echelon along the major line of folding. Outstanding trends are the Beverly-Newport line of shearing and the Whittier fault zone in Los Angeles Basin. The existence of productive fields at regular intervals along a line of folding or shearing has been recognized for many years and now a discovery in a wildcat area immediately suggests a new possible line of folding and results in the drilling of additional tests northwest and southeast of the discovery well. Most of the production trends in the Los Angeles Basin have been tested and prospectors are now faced with the necessity of moving into areas that have not been considered any too favorable in the past but which present potential possibilities. In addition to this, operators are desirous of obtaining relatively shallow production, after engaging in very deep drilling for the past several years, and would like to find several fields that produce a heavy crude oil that could be used to advantage in meeting the constantly increasing demand for fuel oil.

Discoveries have been few and far between in Los Angeles Basin during the past 10 years as only one major field, Wilmington, has been found during that period. Deep drilling, however, resulted in additional zones being discovered at Montebello and extension of the western limits of the Dominguez field in 1939. In 1940, R. R. Bush Oil Co. proved up the Sentous zone of Miocene age as highly productive in the Inglewood field but this horizon has not become of any great consequence up to the present time due to retardation of development work, issuance of Order M-68, and subsequent adoption of a conservation program under supervision of the OPC. Peak production of the Sentous zone will be attained at some time in the future as only a limited number of wells have been drilled to date but the deep zones at Montebello have become badly depleted and the kick is gone from the eighth Callender

zone of Miocene age in the extreme western end of the Dominguez field. There is a possibility that one or more still deeper zones may be found at Montebello.

One field, Turnbull Canyon, was discovered in Los Angeles Basin in 1941 but, while this area showed considerable promise for a short period of time, subsequent developments indicate the field will probably be of secondary importance. The discovery well was 1 Turnbull Community of Continental Oil Co. and it was completed pumping 225 bbl. of clean 25.8-gravity oil daily from 3,447 ft. on October 18, 1941. Geophysical work confirmed the findings of geological reconnaissance and indicated the presence of a plunging anticlinal nose cut off by the Turnbull Canyon fault. Original expectations contemplated a possible productive area of about 750 acres which, if true, and in view of the comparatively shallow depth at which production was obtained, would have represented a discovery of primary importance and a bonanza because of low development costs. This optimism was suddenly shattered, however, when 2 Turnbull Community drilled into a fault at 3,475 ft. and wound up in a gray sand at 3,792 ft. The well was then plugged back to 1,900 ft. and whipstocked to the north and finally completed February 16, 1942, flowing 1,070 bbl. of clean 26.3-gravity oil daily from a total depth of 3,841 ft. and an effective depth of 3,680 ft. Failure to find production south of the Turnbull Canyon fault in 2 Turnbull Community reduced the amount of potentially productive acreage by about 50 per cent and 3 Turnbull Community, still drilling, does not look at all promising because down to 4,900 ft. it has only cored gray sand and a few thin streaks of oil sand. The latter is north of the discovery well and limits the productive zone in that direction. Based on development to date, it appears possible that the Turnbull Canyon field may be a fault trap instead of a plunging anticlinal nose although this remains to be conclusively proved one way or the other. Additional production will, of course, be developed but it is doubtful whether the field will ever prove to be of primary importance in the present zone. Production is believed to be coming from the Sycamore Canyon sand of upper Miocene age and deeper drilling may result in the discovery of additional sands.

New 1942 Field

Texas Co. started off the current year by discovering a new field in the Buena Park section of Orange County but the importance of this new district remains to be determined by future drilling as the discovery well, 1 Spencer in 1-4s-11w, was only good for 90 bbl. of clean 21.3-gravity oil per day under a natural flow with cnly a small quantity of natural gas. The exact point at which production is entering the hole is unknown but is somewhere between 8,900 and 8,932 ft. This well was drilled to a total depth of 9,660 ft., but was subsequently plugged back by stages to 8,980 ft. On the way out of the hole after finding the lower portion unproductive, the company tested several intervals by perforating the 5½-in. casing and then squeezing the perforations and plugging back in the event the tested interval proved unproductive commercially. This was the situation, with the hole plugged back to 8,980 ft. and the casing perforated at 8,900-32 ft., when the production test was made of the present productive zone. The test extended over several weeks during which some remedial work was undertaken and when the well was finally completed the exact point at which oil was entering the hole could not be determined except that it is somewhere between 8,900 and 8,932 ft. On the first test from 8,900-32 ft. the well showed a water cut and a portion of the perforations were squeezed with the result that it is not positively known how much of the interval is open to production.

Structurally, the Buena Park field of Orange County is believed to be a northwesterly plunging anticlinal nose with the plunge more westerly than north. The structure was found by geological mapping and correlation supplemented by geophysical work. The present productive horizon at Buena Park is believed to be the equivalent of the Bell zone of Pliocene age found at about 3,650 ft. in the Santa Fe Springs field. The

(Continued on Page 66)

LOS ANGELES BASIN

Field and county—	Discovery month and year	No. of producing wells 5-31-42	Jan. 1, 1942, cumulative prod. (M. bbl.)	Type of structure†	Depth range (ft.)	Average zone thickness (ft.)	Gravity of oil
Brea Olinda, Orange:		396	160,393				
Puente (M)*	1880			AF	700-2,500	50- 100	17-27
Brea (P)	1899			AF	750-5,600	400-1,000	16-31
Olinda (P)	5-97			AF	700-5,600	400- 500	17-30
Tonner (P)	4-20			A	700-4,100	400- 450	24-28
Buena Park, Orange:							
Spencer (P)	3-42	1	.....	N	8,900-8,932	n.d.	21
Coyote, East, Orange:		117	43,542				
Hualde (P)	3-11			D	2,530-3,850	300	13-26
Anaheim (P)	2-13				3,500-3,750	100- 250	16-19
Mathis (M)	8-27				3,900-5,050	400- 600	18-25
Stern 1 (M)	8-29				4,000-5,250	200- 400	22-25
Stern 2 (M)	7-40				6,000-7,500	400-1,100	24-28
Coyote, West, Orange:		105	126,477				
Murphy (P)	4-09			D	2,850-4,650	400- 700	24-32
Ninety-Nine (P)	3-24				4,200-4,850	700- 900	25-33
Emery-McNally (P)	3-30				5,400-7,050	600- 800	29-33
Dominguez, Los Angeles:		272	130,357				
First and second Callender (P)	9-23			D	3,950-4,650	400- 650	22-25
Third, fourth, fifth Callender (P)	11-24				4,690-5,900	1,350	24-32
Sixth Callender (M)	5-34				6,480-7,150	400- 600	25-33
Seventh Callender (M)	9-35				7,175-7,250	200	28-31
Eighth Callender (M)	6-36				7,200-7,400	25- 250	28-33
El Segundo, Los Angeles:							
El Segundo (M)	8-35	35	10,133	L	7,300-7,500	100- 250	22-27
Huntington Beach, New, Orange:		275	87,838				
Tar (P)	11-26			AF	1,950-2,050	50	13-20
Jones (P)	7-26				2,590-3,100	100- 125	22-24
Barley Flat (P)	12-21				4,200-4,300	100- 125	22-24
Seventeenth Street Town Lot (P)	9-26				4,000-4,250	100- 400	21-25
Huntington Beach, Old, Orange:		351	213,695				
Bolsa Chica (P)	8-20			AF	2,200-3,250	100- 450	18-25
Ashton (P-M)	4-21				3,200-5,100	500-1,300	19-28
Surf (M)	9-22				3,759-5,500	50- 150	21-30
Inglewood:		276	125,819				
Vickers-Machado (P)	9-24			AF	1,700-3,000	750-1,000	14-22
Rindge (P)	7-25				2,990-3,500	600- 700	21-27
Rubel (P)	8-24				3,600-4,100	700- 800	28-32
Moynier (P)	2-32				6,150-6,450	100- 150	17-25
Sentous (M)	9-40				7,900-8,450	150- 500	30-33
Lawndale, Los Angeles:							
Smith (M)	12-28	3	1,123	L	5,300-6,300	100- 180	24-30
Long Beach, Los Angeles:		1,165	666,982				
Wilbur (P)	6-21			AF	2,385-2,500	150- 250	20-23
Alamitos (P)	8-21				2,650-2,900	650- 725	18-25
Brown (P-M)	6-22				3,622-5,000	650-2,000	26-31
Deep (M)	2-29				5,100-8,400	750-1,500	24-28
Hilldon (M)	4-38				7,300-7,500	75- 250	23-26
De Soto (M)	12-38				10,000-10,400	150- 600	26-31
Los Angeles-Salt Lake, Los Angeles:		98	66,182				
Beverly Hills (P)	7-09			A	2,590-3,100	300- 600	15-19
Los Angeles City (P)	1892			AL	900-1,200	75- 300	12-18
Salt Lake (P)	1902			AL	1,850-3,150	200- 500	14-17
Montebello, Los Angeles:		340	127,423				
Baldwin 1 and 2 (P)	2-17			AF	2,150-4,400	750-1,000	17-25
Baldwin 3, 4 and 5 (P)	12-24				3,500-5,000	150- 200	18-26
Nutt (P)	2-35				5,500-6,500	50- 100	34-44
Cruz (M)	9-33				7,000-7,100	25- 75	35-38
Sixth zone (M)	12-37				6,300-6,450	25- 100	28-35
Masser (M)	12-37				6,400-6,600	25- 100	29-39
Seventh zone (M)	11-39				7,150-7,450	25- 150	33-39
Eighth zone (M)	4-39				7,500-7,750	25- 175	33-37
Playa Del Rey, Los Angeles:		128	48,105				
Recreation (M)	12-29			AF	5,200-6,700	75- 200	19-25
Del Rey (P)	7-30				3,850-5,000	400- 700	18-25
Del Rey Hills (M)	11-34				6,000-6,950	25- 350	19-24
Potrero, Los Angeles:							
All sands (P-M)	4-28	23	4,306	AF	3,200-8,375	25- 150	34-48
Richfield, Orange:		309	95,536				
Kraemer (P)	9-18			A	2,275-2,750	200- 700	16-21
Kraemer (M)	6-20				3,500-4,800	300- 600	17-31
Chapman (M)	3-19				3,015-3,900	100- 350	17-25
Rosecrans, Los Angeles:		181	48,315				
Padelford (P)	2-25			DF	4,012-4,950	250- 450	28-32
Howard Park (P)	5-24				4,625-7,600	75- 350	30-38
Maxwell (P)	8-24				3,900-5,300	150- 250	30-39
Hoge (P)	1-25				4,990-5,050	25- 150	31-37
Zinns (P)	11-27				5,800-6,800	75- 150	31-38
O'Dea (M)	3-37				7,400-8,000	100- 250	32-36
Santa Fe Springs, Los Angeles:		578	474,656				
Foix (P)	2-22			A	3,475-3,800	75- 100	28-30
Bell (P)	10-21				3,650-4,000	200- 350	30-32
Meyer (P)	10-19				4,250-4,800	400- 600	32-36
Nordstrom (P)	11-28				4,950-5,450	300- 500	32-36
Buckbee (P)	7-28				5,650-6,290	250- 350	32-38
O'Connell (P)	2-29				6,240-7,300	300- 450	31-37
Clark-Hathaway (P)	6-29				7,070-8,200	600- 750	30-39
Seal Beach, Orange:		132	89,891				
Alamitos (P)	6-31			DF	4,650-7,150	250-1,000	23-30
Bixby (P)	8-26				4,400-4,600	100- 200	22-25
Selover (P)	11-26				4,650-4,850	100- 200	23-28
Wasem (P-M)	2-27				5,250-6,200	750-1,000	25-28
McGrath (M)	2-28				6,550-6,900	750-1,000	25-28
Torrance, Los Angeles:		630	104,744				
Torrance (P)	6-22			AF	3,025-4,000	200- 750	14-19
Harbor City, D. & B. (M)	6-38				4,960-5,275	25- 150	28-29
Lomita, Del Amo (M)	10-37				4,850-5,290	25- 300	21-25
Turnbull, Canyon:							
Turnbull (M)	10-41	2	12	N	3,270-3,680	75- 300	25-26
Whittier, Los Angeles:		158	25,273				
Central (P)	1898			LF	700-2,450	25- 200	14-24
Rideout Heights (P)	1901				800-5,000	25- 150	21-29
Bartolo (P)	7-35				3,114-3,170	10- 30	25-28
Wilmington, Los Angeles:		1,091	140,322				
Tar zone (P)	11-36			AF	1,900-2,600	50- 400	12-15
Upper Ranger (P)	1-32				2,350-2,500	50- 250	13-16
Lower Ranger (M)	11-36				2,500-2,750	50- 250	13-16
Upper Terminal (M)	11-36				2,850-3,450	150- 350	18-25
Lower Terminal (M)					3,400-4,400	150- 600	26-31
Ford (M)					4,850-6,800	750	28-32
Total Los Angeles Basin		6,666	2,791,124				
Total state		17,850	5,841,390				

*Formation. (P) Pliocene. (M) Miocene. †Structures. A—anticline or elongated dome; D—dome; N—nose; L—lens; F—fault.

NORTH CENTRAL TEXAS

Montague County Drilling Campaign Steadily Increasing

By ROBERT INGRAM

WICHITA FALLS, Tex.—A widespread and intense drilling campaign was in full swing in Montague County last week. Much of the new drilling was in pools newly opened, but there were also a number of new wildcats seeking deep pays.

Among the new wells was Sinclair Prairie Oil Co. 2 C. R. Henderson, Block 32, W. E. Martin Survey, 2½ miles northeast of Denver, 176 ft. north of 1 Henderson (see The Oil and Gas Journal, June 29, 1942, p. 228), which was drilling past 375 ft. No. 1 was a junked hole.

In southwestern Montague, Sinclair Prairie was rigging up for a 7,000-ft. wildcat at 1 J. H. Eanes, G. A. Bench Survey, A-1512, 7 miles southwest of Bowie and 3½ miles northwest of a 7,200-ft. well to be drilled in Wise County by Stanolind Oil & Gas Co.

Six miles east of Bowie, Continental Oil Co. was moving in for 1 Mrs. A. Richardson, a 7,400-ft. test in the W. D. Savage Survey, ¼ mile south of the Continental 1 Pearl Mueller, the area's first Simpson producer brought in May 12, last.

In the new Forestburg area of Montague County, Sinclair Prairie was rigging up at 2 I. M. Jones; I. Singletary Survey, A-808, southeast offset to the 7,200-ft. Marble Falls discovery at 1 Jones, and had made location for 3 Jones, M. R. Box Survey, A-53, and 4 Jones, M. R. Box Survey, A-52.

One and one-half miles southeast of Stoneburg, Continental Oil Co. was rigging up 1 Menefee & Hardy, a 7,300-ft. wildcat in Block 10, Limestone C.S.L. Survey, near three other recent failures. Continental also staked location for 1 J. A. Ketchum, Section 43, Hill C.S.L. Survey, A-319, a 7,600-ft. wildcat, 2 miles east of Bowie.

Meantime, W. E. and D. B. Benson were drilling below 4,975 ft. in hard shale at their 6,200-ft. wildcat, 1 L. M. Staley, Section 20, Block 4, H.& T.C. Survey, which is seeking the Caddo lime.

Three miles west of Bowie, Jerry Hawkins 1 Z. T. Lowrie, Section 2824, T.E.&L. Survey, was fishing cones at a total depth of 4,762 ft. This test is 2 miles east of the Hults-Owens pool.

Deepest drilling operation in the county was Continental 1 Penn, A. E. Topper Survey, A-1265, 6 miles northeast of Bowie and a southeast offset to the Gant-Turner discovery, which was drilling below 7,397 ft. This test showed for a small well in the Bend and Viola sections, topped the Simpson at 6,922 ft. and had Simpson dolomite at 7,213 ft.

In northeastern Montague County, S. H. Fagadau staked 1 J. R. Robertson, John Short Survey, A-664, a 4,200-ft. test expected to go to the Ellenburger.

Throckmorton Showing

British American Oil Producing Co. 1 E. M. McCluskey, Block 263, B.B.B.&C. Survey, indicating a new Caddo lime pool 4 miles northwest of the town of Throckmorton in Throckmorton County, recovered 120 ft. of oil-cut mud on a 37-minute drill-stem test at 4,615-39 ft. Electrical survey was run to total depth at 4,639 ft., and then operator decided to drill ahead to the Mississippian lime. Caddo was topped at 4,556 ft.

NORTH CENTRAL TEXAS COMPLETIONS

Wildcats

Archer County: William Clark 1 Key, Blk. 2, Meade L.&M. Pasture subdivision, dry, T.D. 1,501 ft.

Fain-McGaha 1 Turbeville, Lot 45, Jefferson C.S.L. Sur. A-240, dry, T.D. 1,070 ft.

Guy J. Scholl 1 L. K. Kyer, Sec. 89, Jefferson C.S.L. Sur. A-240, dry, T.D. 1,152 ft.

Clay County: Newton Oil 1 Krebs, NE Sec. 41, H.T. &B. Sur. A-228, dry, T.D. 2,297 ft.

Foard County: Bruce Sullivan 1 G. McCoy, J. M. Seaton Sur., temp. abandoned, T.D. 6,016 ft.

Jack County: P. C. Burns 2 Mollie Kemp, A. H. Latimer Sur. A-363, dry, T.D. 3,332 ft.

Montague County: Benson Brothers 1-S Riley, C. Ellis Sur. A-1146, dry, T.D. 1,071 ft.

H. F. Gibson 1 Howard A-686, Sec. 90, Kaufman C.S.L. Sur., dry, T.D. 4,467 ft.

Fields

K.M.A., Wichita County: Grace & Grace 1 Dorris, SE SE Sec. 4, H.T.&B. Sur. A-551, pumped 57 bbl. oil and 37 bbl. water, lime pay 4,043-4,148 ft., acid and shot, T.D. 4,148 ft.

K.M.A.-Ellenburger, Wichita County: Kadane and Mulberry Oil 1-E Mangold, Lot 36, Mangold subdivision, P. Castleman Sur. A-35, flowed 1,336 bbl. after acid, pay 4,245 ft., T.D. 4,307 ft.

Texas 12-E Fred Thom, 2,067 ft. from W line and 538 ft. from N line of south 219 acres of north 370 acres of F. Thom tract in W. H. Spillers Sur. A-257, pumped 75 bbl. after acid, pay 4,358 ft., T.D. 4,366½ ft.

Myers, Clay County: Bridwell Oil 3 Viola Myers, 5,040 ft. from W line and 5,450 ft. from S line of C. Thompson Sur. A-444, outpost, dry, Caddo 5,506 ft., Barnett shale 5,842 ft., Mississippian 6,019 ft., Ellenburger 6,051 ft., T.D. 6,067 ft.

Thornberry, Clay County: C. F. Schram et al 7 D. Summers, Lot 2, W. Wyatt subdivision, dry, T.D. 1,193 ft.

Miscellaneous

Cooke County: S. H. Fagadau 1 J. Wiseman-B, east 40 acres of south 80 acres of north 171 acres of Lot 2, O. F. Leverett Sur. A-607, dry, T.D. 753 ft.

Wichita County: Deep Oil Development et al 1 C. Birk, M. Powell Sur. A-565, dry, T.D. 1,725 ft.

Young County: Phillips 15 Benson-Pan, west 33 acres of N½ Sec. 1450, T.E.&L. Sur., T.D. 955 ft., input well.

Phillips 15 B. Hawkins-Pan, NE NE Sec. 1914, T.E.&L. Sur., T.D. 533 ft., input well.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Bosque County: C. F. Carter 1 Koss Berry, Hugh H. Calvert Sur. 3-850, dry but not plugged, T.D. 720 ft.

Callahan County: George Donnelly 1 H. M. Kennard, Sec. 9, E.T. Sur., dry, T.D. 1,427 ft.

Coleman County: W. M. Holland and Gladys Huffman 1 Dr. R. Baily, Sec. 17, H.T.&B. Sur., pumped 85 bbl. oil and no water after acid, gravity 41, lime pay 2,720-38 ft., T.D. 2,793 ft., *discovery*.

Palo Pinto County: Reed & Kirk 1 Copeland, Sec. 1, A.B.&M. Sur. A-25, dry, T.D. 3,600 ft.

Fields

Avoca, Jones County: Phillips 3 Almquist-Pan, Sec. 181, B.B.B.&C. Sur., dry, T.D. 3,368 ft.

Salt Creek, Brown County: Central Texas Gas 1 W. B. Roberts, Lot 3, William K. Dalton Sur. 57, gaged 6,160,000 cu. ft. gas after acid, lime 1,691-1,741 ft., T.D. 1,868 ft.

Miscellaneous

Brown County: M. W. Walker et al 1 S. H. Shields, Lot 22, G. W. Pentecost Sur. 100, pumped 5 bbl. after acid, lime 1,224 ft., T.D. 1,266 ft.

EASTERN TEXAS

Hunt County Woodbine Find Starts New Play

By ROBERT INGRAM

DALLAS, Tex.—A second drilling campaign in eastern Texas was under way last week even before potential was taken on the discovery well, Hollandsworth Drilling Co. 1 Baker, John Warren Survey, 10 miles southeast of Greenville in southeastern Hunt County. The well was shut in at week's end for potential test after making 264 bbl. in 24 hours through ¼-in. choke from Woodbine sand at 2,761-73 ft. Total depth was 2,778 ft.

Flowing pressure was 90 lb., and 24 hours after the well was shut in, pressure had risen to 170 lb. Although only 12 ft. of the Woodbine was being produced (through 24 perforations in casing), the last core at 2,778 ft. was said to have indicated that the well was again going into saturated sand.

By week's end, five new locations had been made in the new pool. Hollandsworth was skidding rig for the No. 2 Baker, 900 ft. north of the discovery and in the I. Handlin Survey, and announced it would drill 3 Baker, 990 ft. southeast of the discovery in the Warren Survey. A third test was staked as E. B. Germany and Fred Prince 1 C. L. Miller, 8,000 ft. northeast of the discovery well in the north half of a 320-acre tract, C. C. I. & Co. Survey.

D. F. Hughes and L. A. Grelling were asking for permits to drill 1 Graham and 2 Graham, in the Charles Hart Survey, west of the discovery. Exact locations were not announced, but contracts were awarded and one well was expected to be a west offset to the discovery, the other farther to the southeast.

The new pool was expected to cover a relatively small area, although predictions were strongly qualified as it is a fault play and may follow a trend comparable to the Talco pool in Titus and Franklin counties. The pool has already been defined to the south by Cable Tool Drilling Co. 1 Williams, Elam Survey, a failure in both the Woodbine and Paluxy sands drilled a year ago.

Leasing spread to the city limits of Greenville. 10 miles northwest, and there was talk of a town-lot play, characteristically. Unofficially the pool was being called Club Lake.

Rapid Pace at Black Oak

Holes were going down fast in the new Black Oak pool, Paluxy sand discovery, in Wood County. Amerada Petroleum Corp. 2 Kennemer, south offset to the discovery and in the J. Knight Survey, was drilling at 3,480 ft. Amerada 1 Faulk, east offset, was past 2,563 ft., and Amerada 1 Darby, Manuel Y'Barbo Survey, was spudded and was drilling at 544 ft. to make the fifth active operation.

On the northwest, General American Oil Co. 1 Dora Rodney, Y'Barbo Survey, set surface pipe at 800 ft., and Jerry Hawkins 1 Clark, Berry Smith Survey, was trying to stop a surface-casing leak at a depth of 851 ft.

Wildcat Progress

Magnolia Petroleum Co. 1 Fitzgerald, Fitzgerald Survey, northeast outpost to the new Concord Woodbine sand pool of Anderson County, was running about 78 ft. high to the discovery on the Pecan Gap topped at 3,585 ft. . . . Humble Oil & Refining Co. 1 Curtis, John Vaughn Survey, 10,000-ft. wildcat on the Larissa-Bullard structure of northwestern Cherokee County, was drilling below 9,348 ft. in shale and lime.

EAST TEXAS COMPLETIONS

Wildcats

Hunt County: American Liberty 1 J. P. McNatt, dry, T.D. 6,895 ft.

Fields

Chapel Hill, Smith County: Sun 2 S. Friedlander, John Slaydon Sur., flowed 87.5 bbl. through ¾-in. choke, Rodessa pay 7,741-50 ft., gas-oil ratio 613:1, T.D. 8,448 ft.

Hawkins, Wood County: E. Keys and B. F. Phillips 1 Green heirs and Big Sandy Indian School District. J. P. Moseley Sur., flowed 121 bbl. in 4 hr. through ½-in. choke, perf. 4,745-4,912 ft., T.D. 4,943 ft.

Sulphur Bluff, Hopkins County: Shell 2-SW J. G. Reynolds, J. Witmore Sur., T.D. 737 ft., salt-water-disposal well.

Talco, Franklin County: Humble 3-SW Penn-fee, J. D. Bowen Sur., T.D. 4,927 ft., salt-water-disposal well.

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'STARCOR' SELECTED: Jefferson Field . . . retainer squeeze, 6100 ft., 196° F.; 20 sacks 'Starcor', slurry weight 16.4 lbs. per gal., pumped into formation, max. pressure 3800 lbs. Well had been making 210 bbl. fluid, only 10 bbl. oil. After squeeze, well made 252 bbl. oil on ¼″ choke, with 0.3% water.
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HOUSTON

Abell Pool Is Extended to South By Good Well

By ROBERT INGRAM

MIDLAND, Tex.—The Abell Ordovician pool in northern Pecos County was extended ¼ mile south last week by Stanolind Oil & Gas Co. 1 Silverman, a likely big producer from the McKee sand (Simpson). The well flowed at a rate estimated at 60 bbl. an hour during 7 minutes of a 32-minute drill-stem test through ½-in. bottom-hole choke taken at 5,304-72 ft. It blew air in 5 minutes, gas in 6 minutes, mud in 22 minutes, and oil in 25 minutes. Gas was estimated at 19,000,000 cu. ft. daily. When drill pipe was pulled, 150 ft. of drilling fluid was recovered.

The well is located 668 ft. from the southwest and southeast lines of Section 10, Block 3, H.& T.C. Survey. Top of the McKee was reported at 5,311 ft.

On the south end of the Abell area, the Tal-Vez Oil Co. 2 Burnett, Section 5, Block 3, H.&T.C. Survey, east of the Stanolind extension, was drilling below 5,125 ft. in Simpson lime and shale. Top of the Simpson was called at 4,780 ft.

Cambrian Well May Be in Wilberns

Some opinion developed, as final gage was taken, that Gulf Oil Corp. and L. H. Wentz 3 L. H. Millar et al, Section 43, Block 11, H.&G.N. Survey, in northwestern Pecos County, was producing from the Wilberns sand instead of from the Hickory sand. In either event, the pay zone was in Cambrian formations below the Ordovician.

The well, an offset to the 2 Millar, Ordovician discovery brought in last winter, pumped 38.8-gravity oil at the rate of 132 bbl. a day with gas-oil ratio of 227:1. It had been shot in the pay zone, topped at 4,376 ft., with 45 qt. Total depth for completion was 4,406 ft. Top of the Ellenburger was 4,167 ft., top of the Cambrian at 4,376 ft., and base of the sand was 4,392 ft.

Amerada 1-RF University, 1,973 ft. from the south line and 2,065 ft. from the east line of Section 2, Block 48, University Survey, became the seventh producer in the Barnhart field of Reagan County as the sixth well, Ogden & Hawn (formerly M. H. Reed) 2-A University, was being gaged.

On a preliminary test, Amerada's well swabbed 88 bbl. of oil, cut 3 per cent by basic sediment, and 7 per cent water, in 24 hours. It was bottomed at 9,177 ft. in dolomite. Through 2-in. tubing set at 9,115 ft., it was then treated with 5,000 gal. of acid under a 367-bbl. oil load and flush load of 48 bbl. with a jelly blanket on bottom. After the load was recovered, it flowed 115 bbl. of oil in 9 hours through ½-in. tubing choke, cut 10 to 3 per cent by basic sediment and 6 to 1 per cent by acid water.

Amerada 1-RG University, SE SW Section 4, Block 48, University Survey, was drilling below 6,776 ft. in shale and lime. This test is ½ mile southwest of production.

Ellenburger Again Shows On Edwards Plateau

Scattered and slight porosity was reported in the Ellenburger at Cooper Gas Co. 1-D Page, NW SE SE Section 39, Block L, G.H.&S.A. Survey, 3,635 ft. northwest of the 4-A Page, a gas producer in the Page field, Schleicher County. Ellenburger was topped at 6,487 ft. and was cored from 6,491 ft. to 6,503 ft. with 4½-ft. recovery of dolomite carrying slight porosity in the bottom 2 ft.

Another core cut at 6,567-82 ft. returned 10 ft. of dolomite with scattered porosity but no oil. It was deepening below 6,595 ft. in dolomite. Some weeks ago, in Sutton County, adjoining Schleicher to the south, M. C. Moore 1 G. S. Allison, Section 44, Block K, G.H.&S.A. Survey, reported shows in the Ellenburger at 5,311 ft. Both wells are in the little-known Edwards Plateau region.

Rumors Say Deepest Well Is Gusher

Rumors had it that West Texas' deepest oil producer and opener of its eighth Ordovician field, Shell Oil Co., Inc., 1 Sealy-Smith Foundation, Section 38, Block A, G.&M.M.B.&A. Survey, northeastern Ward County, was flowing at the rate of 500 to 3,000 bbl. of oil an hour. Shell offices had no comment. However, no gage had been announced after operators deepened the test to 10,172 ft. after production was discovered at total depth of 10,111 ft. and gage at that depth set at 120 bbl. a day.

SOUTHERN WEST TEXAS COMPLETIONS

Wildcats

Concho County: E. L. Nixon et al 1 J. W. Riley, dry, T.D. 900 ft.

C. C. Smith 1 C. H. Cox, NW NW Sec. 42, Blk. 9, H.&T.C. Sur., location abandoned.

Pecos County: Cardinal Oil 1-A Lowery & Wilson, SE NE Sec. 20, Blk. A, T.C. Sur., elev. 2,709 ft., dry, no shows, T.D. 1,735 ft.

Reeves County: C. A. Kitsos 1 A. B. Burchard, NE SE Sec. 7, Blk. 58, P.S.L. Sur., 15 mi. northeast of Toyah, dry, Delaware lime 3,504 ft., Delaware sand 3,547 ft., T.D. 3,757 ft.

Upton County: Porter Rankin 1 W. H. C. Goode, SW SW Sec. 27, Blk. B, H.E.&W.T. Sur., 1 mi. northeast of Rankin, elev. 2,553 ft., dry, anhydrite 1,165 ft., salt 1,244 ft, lime 3,760 ft., T.D. 4,004 ft.

Fields

Barnhart, Reagan County: Ogden & Hawn 2-A University, 660 ft. from S and E lines of lease, Sec. 2, Blk. 48, University Sur., elev. 2,730 ft., flowed 281 bbl. in 4 hr. through ½-in. tubing choke after acid, base Black shale 8,976 ft., pay 9,072 ft., main porosity 9,086 ft., T.D. 9,072 ft.

Clara Couch, Crockett County: J. H. Elder et al 1-A Clara Couch, NE NE Sec. 37, Blk. GG, dry, T.D. 2,252 ft.

Robert B. Honeyman 1 Clara Couch, NE NW Sec. 37, Blk. GG, H.E.&W.T. Sur., location abandoned.

Estes, Ward County: Gulf 171 Hutchings, SW SW NW Sec. 10, Blk. O, G.&M.M.B.&A. Sur., elev. 2,615 ft., flowed 99 bbl. through casing, pay 2,469 ft., T.D. 2,555 ft., *north edge well.*

Keystone Colby, Winkler County: Parker Drilling 1 M. J. Bashara, SE SW Sec. 21, Blk. 77, P.S.L. Sur., elev. 2,967 ft., flowed 50 bbl. through ½-in. tubing choke after shot, pay 3,345 ft., T.D. 3,465 ft., P.B. 3,445 ft.

North Cowden, Ector County: Stanolind 4-A Midland Farms, NW NW Sec. 46, Blk. 42, Twp. 1n, G.&M.M.B.&A. Sur., elev. 3,059 ft., pumped 629 bbl. oil and 70 bbl. water after shot, pay 4,550 ft., T.D. 4,892 ft., P.B. 4,880 ft.

Sand Hills Ordovician, Crane County: Gulf. 6-B Tubb et al, SW SE Sec. 28, Blk. B-27, P.S.L. Sur., elev. 2,474 ft., flowed 8,711 bbl. through tubing and casing after acid, Ellenburger 5,613 ft., pay 5,650 ft., T.D. 5,672 ft.

Sand Hills, Crane County: Humble 68 Tubb, NW NW Sec. 5, Blk. 32, P.S.L. Sur., elev. 2,618 ft., flowed 413 bbl. through tubing after acid, pay 4,360 ft., T.D. 4,590 ft., P.B. 4,410 ft.

Shipley, Ward County: James H. Snowden et al 16-A Wristen, 2,322 ft. from NE and SE lines Sec. 18, Blk. 5, H.&T.C. Sur., elev. 2,499 ft., pumped 309 bbl. natural, pay 2,440 ft., T.D. 2,601 ft.

Weiner, Winkler County: Westbrook Oil 1-B Brown & Altman, SE SE Sec. 25, Blk. B-5, P.S.L. Sur., elev. 2,813 ft., gaged 12,627,000 cu. ft. gas natural, pay 2,356 ft., T.D. 3,198 ft., P.B. 2,996 ft.

Andrews County Activity Approaching Boom Status

Two Andrews County wells were completed last week, one at West Fuhrman and one at West Andrews, and two new operations were added to the spreading boom in the area. Fuhrman Petroleum Corp. and Superior Oil Co. staked an offset to production in the West Fuhrman area, the 1 Lockhart & Brown, SE SE Section 17, Block A-42, P.S.L. Survey, and Kewanee Oil & Gas Co. staked 1 University SW NE Section 12, Block 11, University land, an east offset to the Atlantic 1-A University.

Meantime, Humble Oil & Refining Co. 1 Sims, Section 24, Block A-29, P.S.L. Survey, deep wildcat 13 miles west of the Fullerton area, was drilling below 7,853 ft. in lime. Twelve miles south of the Fullerton area, Atlantic Refining Co. 1-A Texu, Section 9, Block 12, University land, an Ordovician wildcat, was drilling below 6,680 ft. in lime.

One-quarter mile southeast of production in the West Andrews pool, Neville G. Penrose 1 University, Section 3, Block 10, University land, was drilling below 4,100 ft. in anhydrite and lime. Cross & Johnson 1 University, Section 23, Block 10, ¾ mile northeast of the Mascho pool discovery, was making hole below 3,899 ft. Three-eighths of a mile northwest of production on the west side of the Fullerton area, Magnolia Petroleum Co. 2-11-37 Ralph, Section 11, Block A-37, P.S.L. Survey, was drilling below 6,467 ft. in lime.

Oil Shows in Howard Wildcat

With 700 ft. of oil in the hole at 2,680 ft. in lime, Ray Oil Co. 1 Willard R. Read, 330 ft. from the south and east lines of the east 80 acres of the SE Section 37, Block 30, Township 1n, T.&P. Survey, 6 miles east of Coahoma, offered prospects of extending the Dodge-Denman pool in east Howard County 1 mile north. Oil was found at 2,634-60 ft. The hole was bailed dry at that depth and shut down for 16 hours during which period oil rose 500 ft.

Nairn Discovery May Recomplete

It was reported that J. R. Sharp et al (formerly L. C. Harrison et al) 1 W. G. Nairn estate, Section 25, Block A, P.S.L. Survey, discovery well in Lubbock County, would be cleaned out and reacidized with 15,000 gal. in pay at 4,899-4,921 ft. It had previously been treated with 2,000 gal. and completed in November 1941, for 160 bbl. a day pumping, plus 5 per cent water. The pay had also been shot with 465 qt. at 4,885-5,002 ft., total depth.

NORTHERN WEST TEXAS COMPLETIONS

Wildcats

Borden County: Ed McAdams et al 1 W. D. Johnson, Jr., SW NE Sec. 35, Blk. 32, Twp. 5n, T.&P. Sur., central part of county, dry, anhydrite 1,180 ft., lime 3,100 ft., lost circulation 4,801-35 ft., T.D. 4,970 ft.

Hockley County: Bruce McKague 1 J. H. Goodpasture, SE SE Lab. 16, Lge. 17, Wichita C.S.L. Sur., 9 mi. northeast of Slaughter, dry, anhydrite 2,180 ft., Brown lime 3,720 ft., San Andres 4,070 ft., T.D. 5,202 ft.

Fields

Cedar Lake, Gaines County: George P. Livermore 2 Jones, SW SW Sec. 2, Blk. C-30, P.S.L. Sur., swabbed 406 bbl. natural through casing, pay 4,665 ft., T.D. 4,770 ft., *north edge well.*

Slaughter, Hockley County: Honolulu 17 Frazier, NW SE Sec. 10, Blk. X, P.S.L. Sur., elev. 3,520 ft., flowed 2,057 bbl. through 2½-in. casing outlet after acid, pay 4,900 ft., T.D. 4,990 ft.

Honolulu 18 Frazier, SW NE Sec. 10, Blk. X, P.S.L. Sur., elev. 3,493 ft., flowed 1,646 bbl. through 2½-in. casing outlet after acid, pay 4,860 ft., T.D. 4,960 ft.

Honolulu 19 Frazier, SE NW Sec. 10, Blk. X, P.S.L. Sur., elev. 3,504 ft., flowed 2,019 bbl. through 2½-in. casing outlet after acid, pay 4,890 ft., T.D. 4,990 ft.

Honolulu 17-A Mallett, SE SE Lab. 20, Lge. 52, Scurry C.S.L. Sur., elev. 3,570 ft., flowed 433 bbl. through 2½-in. casing outlet after acid, pay 4,988 ft., T.D. 5,035 ft.

Honolulu 38-B Slaughter, SW SW Lab. 24, Lge. 37, Zavalla C.S.L. Sur., elev. 3,525 ft., flowed 980 bbl. through 2½-in. casing outlet after acid, pay 4,915 ft., T.D. 5,000 ft.

Western States Gas 5 Coons, SW NW Sec. 11, Blk. X, P.S.L. Sur., elev. 3,516 ft., flowed 1,731 bbl. through casing after acid, pay 4,935 ft., T.D. 5,010 ft.

(Continued on Page 68)

SOUTHWEST TEXAS

Prospective De Witt County Wilcox Discovery to Test

By F. L. SINGLETON

CORPUS CHRISTI, Tex.—Tide Water 1 Gips, a prospective Wilcox sand pool opener 11 miles southwest of the town of Yorktown, De Witt County, was being prepared for a production test. With the hole bottomed at 8,500 ft., 5½-in. casing was cemented at 8,400 ft., and tests of three sand sections in the Wilcox were scheduled to be made. Drill-stem testing several weeks ago at 7,027 ft. recovered several hundred feet of pipeline oil and some salt water, while an electrical survey showed possible production in deeper sands at 8,100 ft., 8,200 ft., and 8,300 ft. Should the well be completed as a producer, it will open the third Wilcox sand pool for the county and further enhance Wilcox sand development along this particular sector of the trend.

Location for another interesting Wilcox sand test was announced for Bee County as preparations were being made to move in material for Mills Bennett and Anderson-Pritchard 1 Felipe Perez, located in the Section 8 Jose Maria Uranga grant in West Tuleta area. The location is about 1 mile southwest of a recent Wilcox test drilled by Dirks Brothers et al, which logged some interesting showings.

In the meantime, Bee County had promise of another Pettus sand discovery with the showing of W. E. Rowe and McBride, Inc., 2 M. J. White, 4 miles northwest of Rynana in the southern part of the county. Gas sand was cored at 4,194-98 ft., and sand showing oil was cored at 4,198-4,201 ft. A 20-minute drill-stem test at 4,199-4,201 ft. tested 38-lb. working pressure and recovered 400 ft. of oil and 980 ft. of oily salt water. Additional sand was cored to a total depth of 4,223 ft., and the well is shut down at 4,283 ft., after topping salt water sand at 4,273 ft.

Seeligson Outpost Preparing To Test Deep Sand

Humble 1 King, an important east outpost to the Seeligson field of Jim Wells County, and located in Kleberg County, is preparing to make another drill-stem test after coring sand at 5,991-6,001 ft. This sand correlates with the deepest sand in the Seeligson field proper and casing may be cemented following the drill-stem test. This well definitely established production from a new and shallower pay at approximately 4,200 ft. and drill-stem testing in the regular field pay at 5,200 ft., 5,500 ft., and 5,900 ft. recovered pipe-line oil.

SOUTHWEST TEXAS COMPLETIONS
LOWER GULF COAST DISTRICT

Fields

Agua Dulce, Nueces County: Ginther et al 3 Eliff, 140 bbl., ⅛-in. choke, perf. casing 6,913-20 ft., T.D. 7,080 ft.

Richardson 1 Driscoll, 151 bbl., ⅛-in. choke, T.D. 6,890 ft.

Odem, San Patricio County: Seaboard 5 Compton, 8 bbl., ⅛-in. choke, perf. casing 5,326-29 ft., T.D. 7,450 ft.

S. E. W. Oil Co. 1 Whitley, spudded and abandoned, T.D. 975 ft.

St. Charles, Aransas County: Continental 4 St. Charles Co., 63 bbl., plus 8 per cent b.s.&w., 4/16-in. choke, perf. casing 9,392-9,400 ft., T.D. 9,545 ft.

Stratton, Nueces County: Chicago Corp. 27 Wardner, 258 bbl., open flow, T.D. 6,761 ft.

Southern Minerals 42 Stratton, 81 bbl., 7/64-in. choke, perf. casing 6,460-80 ft., T.D. 6,671 ft.

LAREDO COMPLETIONS

Wildcats

Hidalgo County: Baldridge & King 1 Perez, dry, T.D. 6,512 ft.

Phillips 1 Osca Dasham, dry, T.D. 6,500 ft.

McMullen County: Quintana 1-C South Texas Syndicate, completed as fresh-water well, T.D. 7,623 ft.

(Continued on Page 62)

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APPALACHIAN FIELDS

Wick Anticline Test in West Virginia Nears Oriskany

PITTSBURGH, Pa.—In West Virginia, a deep test on the west flank of the heretofore untested Wick anticline is drilling through the Corniferous lime and should reach the Oriskany this week. The completions in the Jackson County Oriskany field were numerous and of fair size. In Southwest Pennsylvania, none of the deep tests drilling are at a critical stage.

The test of the Peoples Natural Gas Co. on the Jacobs Creek Oil Co. lease on the Fayette anticline in South Huntington Township, Fayette County, is now drilling in the Helderberg with nothing showing in the Oriskany sand. The Oriskany was topped at 7,902 ft., Helderberg at 7,982 ft. It will be deepened into the Helderberg.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, South Bend Township: Shelocta 1 Duff Rupert, 206,000 cu. ft. gas; Murraysville 1,148-97 ft., gas 1,191 ft., Hundred-foot 1,200-1,315 ft., gas 1,220 ft., Thirty-foot 1,320-45 ft., gas 1,324-31 ft., T.D. 1,546 ft.

Clarion County, Monroe Township: Owens Illinois Glass Co. 1 David Fox, 132,000 cu. ft. gas, Murraysville sand, T.D. 1,285 ft.

Greene County, Perry Township: Carnegie 1 E. A. Phillips, 561,000 cu. ft. gas, Big Injun sand 2,111 ft., gas 2,227-29 ft., T.D. 2,230 ft.

Indiana County, Washington Township: T. W. Phillips Gas & Oil Co. 1 D. B. Kunkle, dry, T.D. 1,724 ft.

Washington County, Morris Township: Union Gasoline & Oil Corp. 837 M. D. Craft, dry, Fifth sand 2,764-47 ft., show oil 2,772-75 ft., show gas 2,787-90 ft., T.D. 2,810 ft.

A. V. Lewis et al 1 B. C. McCarroll, 89,000 cu. ft. gas, Fifty-foot 2,703-82 ft., gas 2,729 ft., T.D. 2,858 ft.

Westmoreland County, Bell Township: General Refractories Co. 1 Apollo Coal Co., 1,543,000 cu. ft. gas, Tiona 2,568-91 ft., gas 2,570 ft., T.D. 2,594 ft.

WEST VIRGINIA

In Grant district, Ritchie County, the wildcat of Benedum & Trees on the L. J. Rinehart farm is nearing the Oriskany sand. It is drilling at 5,875 ft. Top of the Corniferous was at 5,651 ft.

WEST VIRGINIA COMPLETIONS

Boone County, Peytonia district: Owens, Libby-Owens 636 Bull Creek Coal & Land Co., 21,060 cu. ft. gas, Big lime 1,153-1,314 ft., Berea 1,779-84 ft., brown shale 3,372-3,591 ft. and 4,028-4,308 ft., Oriskany 4,443-49 ft., T.D. 4,530 ft.

Braxton County, Otter district: Trace Gas Co. 1 Curtis W. Gerwig, 80,000 cu. ft. gas, Injun sand, Big lime 1,990-2,115 ft., Injun 2,115-40 ft., T.D. 2,150 ft.

Calhoun County, Center district: Hope 8602 Allen Hardman, 900,000 cu. ft. gas, gas 825-30 ft., Big Injun 1,645-1,710 ft., shot 1,682-1,709 ft., T.D. 1,739 ft.

Sheridan district: Hope 8607 Soloman Holpp, 15 bbl. and 39,000 cu. ft. gas, Maxton sand 1,862-85 ft., gas 1,868-73 ft., oil 1,880-85 ft., shot 1,868-73 ft., T.D. 1,885 ft.

Clay County, Buffalo district: Pittsburgh & West Virginia Gas Co. 7862 Elk River Coal & Lumber Co., 106,000 cu. ft. gas, Injun sand, T.D. 1,939 ft.

Pleasants district: W. A. Bickerstaff 1 James Reed heirs, 25,000 cu. ft. gas, Big lime 1,990-2,120 ft., Injun 2,120-55 ft., shot 2,116-63 ft., T.D. 2,200 ft., R.P. 310 lb.

Gilmer County, Center district: Hope Natural Gas Co. 8617 F. R. Beall, 200,000 cu. ft. gas, Injun sand T.D. 2,170 ft.

South Penn Natural Gas Co. 1 T. M. Marshall, dry, through Injun sand and Berea, T.D. 2,652 ft.

Hancock County, Grant district: R. J. Braden Co. 31 Hewitts heirs, 1 bbl., Berea, T.D. 830 ft.

Jackson County, Ravenswood district: Boggess Drilling Co. 1 D. C. Nuzum, dry, Salt sand 2,038-2,205 ft., Big lime 2,205-71 ft., Big Injun 2,275-86 ft., no Berea, T.D. 2,770 ft.

Kanawha County, Louden district: Godfrey L. Cabot, Inc. 1 Dickinson-Levi, 133,000 cu. ft. gas, Weir sand, T.D. 1,816 ft., R.P. 190 lb.

Malden district: Cameron Producing Co. 1 B. T. Belcher, 421,000 cu. ft. gas, Weir sand, T.D. 2,472 ft.

Lewis County, Freemans Creek district: South Penn 11 John Tierney, 4 bbl., Gantz sand, T.D. 2,595 ft.

McCall Drilling Co. 1 M. H. Piercy, dry, Injun sand, T.D. 2,243 ft.

Lincoln County, Washington district: United Carbon Co. 5 Lincoln Mineral Co., 379,000 cu. ft. gas, Big lime 1,794-1,987 ft., Injun 1,987-2,040 ft., Berea 2,458-80 ft., gas 3,076-4,108 ft., T.D. 4,108 ft.

Logan County, Logan district: South Penn 69 Yawkey-Freeman, dry, Big lime 2,048-2,236 ft., Injun 2,236-40 ft., Berea 2,748-78 ft., shot, T.D. 2,778 ft.

Monongalia County, Battelle district: Manufacturers Light & Heat Co. 3651 Arzie Tennant, dry, Pittsburgh Coal 934-42 ft., Big lime 2,154-2,220 ft., no Bayard, T.D. 3,456 ft.

Putnam County, Curry district: Easter Gas Co. 2 T. C. Easter, 301,000 cu. ft. gas, Big lime 1,400-1,580 ft., Injun 1,605-45 ft., Berea 2,090-2,111 ft., T.D. 2,127 ft.

R. H. Adkins 1 Floyd Mabe et al, 152,000 cu. ft. gas, Salt 1,185-1,500 ft., Big lime 1,575-1,725 ft., Big Injun 1,759-1,815 ft., Berea 2,250-73 ft., T.D. 3,283 ft.

Upshur County, Meade district: French Creek Oil & Gas Co. 1 L. F. Hammer, 175,000 cu. ft. gas, Gordon sand 2,205-31 ft., gas 2,209-24 ft., T.D. 2,260 ft.

Wetzel County, Clay district: Johns Gas Co. 3 H. H. Little, drilled deeper, dry, through Gordon sand. T.D. 3,220 ft.

ORISKANY GAS FIELDS

Jackson County, Ripley district: Columbian Carbon Co. 1 R. A. Shinn, 11,255,000 cu. ft. gas before shot, Oriskany 5,068 ft., T.D. 5,086 ft., R.P. 1,650 lb.

Columbian Carbon Co. 2 C. M. Winter, 13,127,000 cu. ft. gas before shot, Oriskany 5,151 ft., T.D. 5,158 ft., R.P. 1,640 lb. 24 hr.

Columbian Carbon Co. 1 J. T. Boice, 1,295,000 cu. ft. gas, Corniferous lime 4,880-4,987 ft., gas 4,994 ft., gas 5,001-05 ft., shot 4,990-5,030 ft., T.D. 5,077 ft.

Washington district: United Fuel Gas Co. 5093 Cora Southall, 8,716,000 cu. ft. gas before shot; Oriskany 5,188 ft., gas 5,191-5,200 ft., R.P. 1,625 lb., T.D. 5,200 ft.

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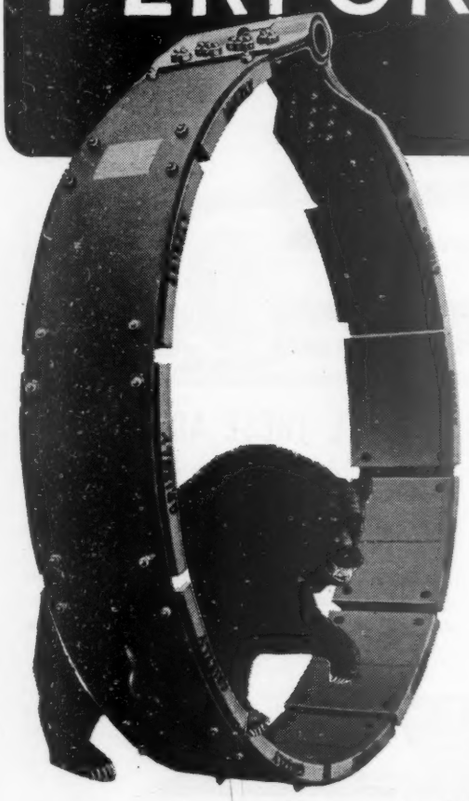

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ROTARY BLOCKS

Two Noble County Discoveries Placed on Production

By CARL HOOT

THIRTEEN wildcat completions for the week in Oklahoma shows an upturn in exploratory work. In Noble County two pool openers were officially completed and given new names by the Nomenclature Committee. Deep Rock 1 Schultz, NW SW SE 9-22-2, flowed 1,260 bbl. of 45.3-gravity oil and opens the new Liberty pool. Danciger Oil 1 Province, NW NW SW 4-20-2w, flowed 480 bbl. of 41-gravity and is the discovery well of Northeast Lucien. Both wells are producing from the second Wilcox. Six of the test wells were in southern Oklahoma. In Marshall County Samedan Oil 1 Godfrey, NE NE SW 13-6s-6, was dry at 3,690 ft. Considerable interest was shown in this well when an oil and gas show was found on drill-stem test at 3,100-83 ft. Location is some 6 miles southeast of the Madill pool and 5 miles southwest of Cumberland.

Other new oil pools named by the Nomenclature Committee and their discovery wells were: W. C. McBride 1 Replogle, NE NW SW 13-11-10, Okfuskee County, which flowed 44 bbl. from Gilcrease sand at 2,915-25 ft., opened the Northwest Clearview pool. Portable Drilling et al 1 School land, SW NE NE 36-18-1, Payne County, flowed 94 bbl. from Hunton lime at 2,746-56 ft., discovery of North Coyle. Atlantic Refining Co. 1 Hamil, NE SW 27-8-3, Pottawatomie County, flowed 151 bbl. in 11 hours from Hunton at 4,598-4,795 ft., opens the Macomb pool. Also in Pottawatomie County, 2 miles west of the Romulus field and at the edge of the town of Romulus, J. F. Smith 1 DeGroff, NW SE NE 1-7-3, made 108 bbl. potential from Hunton at 4,367-86 ft. Recommended name was Romulus Townsite.

West Loco Field Extended

In Stephens County, O. L. Peck 1 Peck, SW NE NE 1-3s-6w, flowed 50 bbl. of oil and 5,000,000 cu. ft. of gas from lime and sand at 1,180-1,209 ft. and apparently is a 1-mile northwest extension to the West Loco pool, where production is from sand at approximately the same depth. Location is just north of a small unnamed gas area.

OKLAHOMA COMPLETIONS

Wildcats

Carter County: Carter Oil 1 Gardner, SW NW 3-5s-2w, dry, T.D. 4,001 ft.

Carter Oil 1 Hernstadt, NE NE 24-4s-2w, dry, T.D. 7,500 ft., show oil and gas 6,974-7,000 ft.

North of Healdton: W. L. Hernstadt et al 2 Trustee, NW SE 29-3s-3w, dry, T.D. 5,003 ft.

Creek County: Superior Oil 1 Anthis, NW SE 34-16-7, dry, T.D. 4,090 ft., Oswego 2,825 ft., Verdigris 2,920 ft., Mayes 3,518 ft., Woodford 3,900 ft., Sylvan 3,945 ft., Viola 3,985 ft., Wilcox 4,050 ft.

Jefferson County: Gulf 1 Beavers, NW NE 35-3s-6w, dry, T.D. 3,715 ft., Arbuckle 3,565 ft.

Kiowa County: E. M. Thomassen 2-A Baker, NE NE NW 7-6-18w, dry, T.D. 1,258 ft., granite wash 1,100-1,216 ft.

Logan County: Kubat et al 1 School Land, SE NE SW 16-17-1w, dry, T.D. 5,504 ft., Oswego 4,656 ft., Bartlesville 5,018 ft., Hunton 5,102 ft., Viola 5,235 ft., Wilcox 5,327 ft., second Wilcox 5,473 ft.

Marshall County: Samedan Oil 1 Neff-Godfrey, NE NE SW 13-6s-6, dry, T.D. 3,690 ft., Mississippi lime 1,318 ft., Woodford 1,385 ft., Viola 1,950 ft., McLish 3,230 ft., drill-stem test 3,100-83 ft., recovered hot gas and mud.

Muskogee County: W. B. Pine 1 Steele, SE NE NW 24-13-17, dry, T.D. 2,564 ft., Wilcox 2,535 ft.

Noble County, discovery of Liberty pool: Deep Rock 1 Schultz, NW SW SE 9-22-2, flowed 1,260 bbl., second Wilcox 4,508-14 ft., T.D. 4,765 ft., gravity 45.3

Discovery of northeast Lucien: Danciger Oil 1 Province, NW NW SW 4-20-2w, flowed 480 bbl., second Wilcox 5,391-5,405 ft., 41 gravity.

Osage County: Cortez Oil 1 Osage, SE cor. 3-23-11, dry, T.D. 1,794 ft., Bartlesville 1,652 ft., Mayes 1,747 ft.

Stephens County: Louis Sikes 1-A Johnson, SE SE NW 17-1-8w, dry, T.D. 5,112 ft.

Fields

Altus, Jackson County: Geddes-Fleming 1-A Byrd, SE NW 14-1-20w, pumped 7 bbl., T.D. 1,592 ft.

Isom Springs, Marshall County: E. J. Gill 4 Adams, SE NE NE 6-8s-6, pumped 40 bbl., T.D. 537 ft.

Garber, Garfield County: Sinclair Prairie 22-C Crews, S½ NW SE 19-22-3w, pumped 52 bbl., sand 1,392-1,407 ft., T.D. 1,414 ft.

Hotulke, Pottawatomie County: Anderson-Prichard 3 White, SW NW 30-9-5, flowed 209 bbl., Hunton 4,128-38 ft., T.D. 4,200 ft.

Loco, West, Stephens County: O. L. Peck 1 Peck, SW NE NE 1-3s-6w, flowed 50 bbl. and 5,000,000 cu. ft. gas, lime and sand 1,180-1,209 ft.

Otoe City, Noble County: Superior Oil 3 Faubian, W½ NW SE 16-22-1, flowed 180 bbl., Laton sand 3,365-99 ft.

Pauls Valley, Garvin County: Pure Oil 4 Teter, SE SE NW 31 4-1, flowed 427 bbl. in 4 hr., sand 4,016-44 ft.

Miscellaneous

Creek County: Link Oil 10 Haggard, SE NE NE 33-18-7, pumped 2 bbl., T.D. 1,465 ft.

Gulf 36 Berryhill, NE SE NE 17-17-12, pumped 14 bbl., sand 1,429-1,572 ft., T.D. 1,578 ft.

Gulf 38 Berryhill, SW SW NE 17-17-12, dry, T.D. 1,593 ft., input well.

Osage County: J. R. Sharp 3 Osage, NW NW SE 18-22-12, pumped 60 bbl., sand 1,754-71 ft.

W. L. Martin 1, SW NW SW 33-20-12, dry, T.D. 1,251 ft.

Peters Pet. 5 Osage, NW SW SE 10-21-8, dry, T.D. 2,995 ft.

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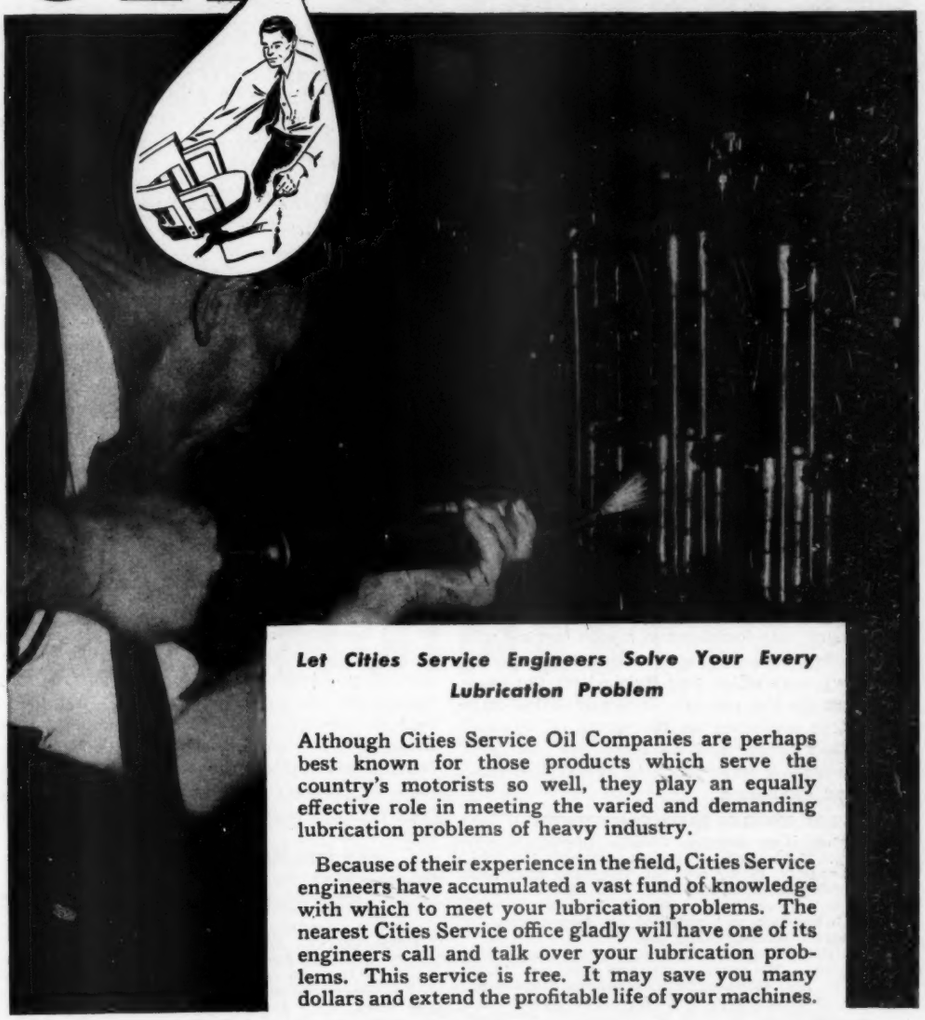

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CITIES SERVICE OILS ONCE-ALWAYS

Two Buena Park Wells Are Near Critical Depth

By L. P. STOCKMAN

LOS ANGELES, Calif.—Texas Co. has reached the critical depth in both of its Buena Park wells and their status should be determined in the near future. The outpost located west of the discovery well is going ahead at 9,150 ft. but has not yet found a solid sand body. It was expected that this west extension would be deeper stratigraphically and it has been running true to form as it is quite a bit lower than 1 Spencer, the company's discovery well. It should pick up the Spencer sand within the next 100 ft. and its showing in that sand may be the tipoff as to what the Buena Park field will be good for in the future. The company's 1 Buena Park Unit 1, located east of the discovery well, is drilling and coring in oil sand, shale and gray sand at 8,861 ft. and it will take some sharpshooting to pick out the thin section of oil sand from which to produce. Both wells are running according to expectations as far as structural conditions are concerned but both should have shown more oil sand. The next few hundred feet of hole should determine to some extent whether the Buena Park field will attain primary importance from a production standpoint or prove of secondary importance.

Continental's northern outpost in the Turnbull Canyon field of Los Angeles Basin has reached a depth of 5,606 ft. and unless something shows up very soon the test will probably be abandoned. At the above depth the bottom of the hole is probably in basal Miocene as production in this field is coming from the Sycamore Canyon sand of upper Miocene age. This well, 3 Turnbull Canyon Community, failed to find production in the Sycamore oil sand although a few thin streaks were found in this interval. When this field was first discovered it was felt that Continental Oil Co. had found a relatively large field from an areal standpoint but when the second well drilled through a fault it automatically reduced the amount of probable acreage 50 per cent. When this second well was whipstocked to the north it was completed as a good flowing well in the Sycamore oil sand in contrast with the discovery well which was finished on the beam pumping 225 bbl. per day. It is a little too early to make a prediction on the future of this and the Buena Park field as there has not been enough drilling undertaken to reveal structural and sand conditions.

LOS ANGELES BASIN COMPLETIONS

Wilmington, Los Angeles County: Royalty Service Corp. 20-7-1 Hall, 33-4s-13w, pumped 163 bbl., 14.5-gravity, 15 per cent cut, T.D. 3,590 ft., gravel-packed perf. 2,650-2,880 ft., 3,110-3,590 ft., pulled 8⅝-in. casing from 2,600 ft. in original well, set whipstock and redrilled to Ranger zone at 3,590 ft., reconditioning job.

Union Pacific Railroad Co., 217 fee, 3-5s-13w, flowed 197 bbl., 27.1-gravity, 0.1 per cent cut, 15,000 cu. ft. gas, 48/64-in. bean, pressures 210/450 lb., T.D. 3,419 ft., P.B. 3,395 ft., gravel-packed perf. 2,538-2,669 ft., 2,737-88 ft., 2,942-3,032 ft., 3,066-3,129 ft., 3,144-80 ft., 3,212-60 ft., 3,280-3,389 ft., gray sand on bottom, completed in Ranger zone of Miocene age.

Recement Job Necessary At Wheatfield Wildcat

Amerada Petroleum Corp. got a wet job on 4-6 Truman in 6-17s-16e in the Wheatville district of Fresno County and the liner has been pulled and a recement job undertaken. This promising wildcat looked quite good during the course of work to date and it is quite probable that a new field may be opened up at this point after the necessary remedial work has been finished. Amerada has location staked for 72-1 Whitty in 1-17s-17e but no actual drilling will be done until after completion of work on the Truman wildcat. In the Riverdale field Amerada Petroleum Corp. successfully completed 74-22 Clements in 22-17s-19e and 38-23 Zanolini in 23-17s-19e but no gage has yet been made of the latter. It looks like a normal completion, however, and while it is flowing steadily the initial production is not overly large. At Helm, another field in Fresno County which was discovered by Amerada, the company has completed 37-27 Weyant in 27-16s-17e. The Raisin City field has become relatively inactive and not great change is expected due to the unfavorable conditions of the area from a drilling and production standpoint. Seaboard Oil Corp. is still working on 53-13 S.T.U. at Raisin City and at the close of the current week was still drilling ahead below the Seaboard oil sand.

Third Panoche Test Dry

Jergins Oil Corp. is considering abandonment of 3 Cheney ranch in the Panoche district of Fresno County due to the failure of the well to find the Cheney oil sand in the Cretaceous and if this is done the area may stand inactive for a long time. This is the third well drilled in the Panoche district and at 7,700 ft. the outlook is distinctly disappointing especially in view of the fact that the upper part of the hole appeared to be running structurally higher. Out of three wells drilled to date, Jergins Oil Co. has one small well flowing about 15 bbl. of high-gravity oil per day. Jergins' 3 Cheney ranch is located in 30-14s-13e not far removed from other wells drilled previously. Interest in the Cretaceous appears to have dwindled again but will probably be revived in the not far distant future as rocks of this age have not been subjected to as intensive search as has been the case with the Pliocene, Miocene and Eocene. If some one should develop commercial production in California from the Cretaceous the state probably will see the wildest rush for Cretaceous structure that has ever been witnessed. The entire central part of the state contains great thicknesses of Cretaceous formations but contrary to expectations there has been no great rush to begin exploratory work in that area.

SAN JOAQUIN VALLEY COMPLETIONS

Belridge, South, Kern County: Belridge Oil Co., 67-33-A fee, 33-28s-21w, pumped 75 bbl., 15.9-gravity, 1 per cent cut, T.D. 771 ft., 120 mesh perf. 487-771 ft., completed in upper zone of Pliocene age.

Union Oil Co., 43-10 Hopkins, 10-29s-21e, pumped 79 bbl., 14.3-gravity, 5 per cent cut, T.D. 1,990 ft., P.B. 1,180 ft., perf. 1,049-1,179 ft., completed in upper zone of Pliocene age.

Elk Hills, Kern County: Standard Oil Co., 44-33-S, 33-30s-24e, flowed 1,550 bbl., 38.3-gravity, 0.5 per cent cut, 2,500,000 cu. ft. gas, 32/64-in. bean, pressures 750/1,250 lb., T.D. 8,215 ft., completed in Stevens oil sand of Miocene age.

Helm, Fresno County: Amerada Petroleum Corp., 37-27 Weyant, 27-16s-17e, flowed 216 bbl., 32.7-gravity, 2 per cent cut, 940,000 cu. ft. gas, 12/64-in. bean, pressures 500/900 lb., T.D. 8,160 ft., perf. 8,070-80 ft., 8,120-60 ft., completed in Clover oil sand of Eocene age with only 10 ft. of perf. open in gas cap.

Mount Poso, Kern County: C.C.M.O. Co. 4 Mon, 26-27s-28e, pumped 100 bbl., 16-gravity, 3 per cent cut, T.D. 1,476 ft., 120 mesh perf. 1,425-75 ft., completed in Vedder zone of Miocene age 1,435-76 ft.

Midway-Sunset, Kern County: H. & T. Oil Co., 5 Midway, 23-31s-22e, pumped 42 bbl., 15.6-gravity, 7 per cent cut, T.D. 1,435 ft., P.B. 890 ft., perf. 770-890 ft., completed in upper zone of Pliocene age.

Riverdale, Fresno County: Amerada Petroleum Corp., 74-22 Clements, 22-17s-19e, flowed 250 bbl., 34-6-gravity, 0.5 per cent cut, 800,000 cu. ft. gas, 16/64-in. bean, pressures 600/1,000 lb., T.D. 6,840 ft., perf. 6,795-6,840 ft., completed in Lawton Temblor zone of Miocene age, production based on short flow, now shut in pending erection of storage tanks.

Tupman, Kern County: Richfield Oil Corp., 74-30-A Kern County Land, 30-30s-25e, flowed 650 bbl., 34.3-gravity, 2 per cent cut, 1,000,000 cu. ft. gas, 18/64-in. bean, pressures 400/900 lb., T.D. 9,375 ft., perf. 8,812-97 ft., 8,938-9,019 ft., 9,050-9,212 ft., 9,237-58 ft., 9,283-9,318 ft., completed in Stevens oil sand of Miocene age.

Ventura County Wildcats Show Little Promise

Richfield Oil Corp. is making a production test on 44 Ojai in the Ojai district of Ventura County and current production approximates 40 bbl. of net 15-gravity oil per day. Gross fluid is averaging about 100 bbl. daily and it may be possible that production will build up later after the well has had a chance to clean itself out. Richfield drilled this well as a deep test but after reaching a depth of 8,755 ft., and not finding much to encourage further work plugged the hole back to 5,111 ft. If production cleans up somewhat, this 5,100-ft. zone might prove commercially productive although at present prices there is not much incentive to proceed with development work on a 5,100-ft. hole. Continental has resumed drilling at its wildcat in the Piru district of Ventura County which looked so good a short time ago and in which about 200 ft. of good-looking oil sand was cored but found too tight for commercial production. Core recovery was poor during the course of drilling through the oil sand and hence the condition of the entire zone was not known. Every core recovered, however, looked good and the crews were surprised when the well failed to produce. This is a common characteristic of this region and is very pronounced in the Rincon field of Ventura County where in one well about 1,000 ft. of almost solid oil sand was found too tight to produce more than a few hundred barrels per day on the beam. At the present depth 4,600 ft. the log shows the formation to be a sandy shale with occasional streaks of oil sand. No favorable body of sand has been cored since passing through the upper zone which might possibly be the equivalent of the first Modelo zone of Miocene age that is present in many fields to the east of Piru in Los Angeles County.

Barnsdall Oil Co. has staked location for an offset to be drilled west of 1 Ferguson of C. G. Willis and associates at the extreme eastern end of the Newhall Potrero field but actual work will not be undertaken for about 60 days due to other prior work. Barnsdall's Rancho San Francisco lease in the Newhall Potrero field extends down to the Ferguson property and for this reason it is logical to assume that Barnsdall will get good production upon completion.

COASTAL DISTRICT COMPLETIONS

Sespe, Ventura County: J. A. Ivers, 13½ Kentuck, 1-4n-20w, pumped 20 bbl., 25.7-gravity oil, 5 per cent cut, T.D. 1,620 ft., perf. 1,095-1,400 ft., 1,405-1,615 ft., completed in Sespe oil sand of Miocene age, the designation of this well indicates it is located on the Kentuck half of Ivers' property.

Southwest Texas

(Continued from Page 59)

Starr County: D. Davenport et al 1 Garza, dry, T.D. 4,520 ft.

Fields

Colorado. Jim Hogg County: Humble 71-B King, 176 bbl., ¼-in. choke, T.D. 3,117 ft.

Margo, Starr County: E. A. Schmitt 1 Gonzales, dry, T.D. 3,940 ft.

Sun, Starr County: Humble 11 Montalvo, 59 bbl., ⅛-in. choke, T.D. 4,612 ft.

SOUTH CENTRAL TEXAS COMPLETIONS

Wildcats

Bastrop County: Marts & Beavin 1 Danneley, dry, T.D. 3,003 ft.

Waltersburg Shows in Test Southwest of Evansville

EVANSVILLE, Ind.—One of the most interesting tests in Indiana in several months, United Oil Co. and George E. Nelson 1 P. Stader, NE SE NW 32-6s-11w, 2 miles southwest of Evansville, appears to be one of the most promising tests yet drilled in the county. About 8 in. of saturation in the Waltersburg sand was recovered and overnight oil rose 1,000 ft. in the hole. Top of the pay is 1,780 ft. Storage tanks have been set and operators plan to drill the well on into the Waltersburg.

No. 1 Stader is a 40-acre offset to Sells Petroleum Co. 1 McCarty, which several months ago found a favorable show in the Waltersburg and since has been testing.

R. D. Brown 1 Lehman, SW SW NE 36-1s-10w, 3½ miles north of Francisco, flowed 97 bbl. of oil in 24 hours from the Hardinsburg sand at 1,333-51 ft. and appears to be the best producer in the area. After the 24-hour test, the well swabbed about 50 bbl. in 1 hour. It has not been shot.

INDIANA COMPLETIONS

Daviess County: General Oil 2 Singleton, W½ SW SW 21-2n-7w, dry, T.D. 928 ft., Cypress sand 919 ft.

Mid-Sun Oil 1 Lashley, S½ SW SE 9-2n-6w, dry, T.D. 762 ft. in upper Glen Dean.

Gibson County: Muter Oil et al 1 Day, SE SW NE Don. 94-1n-10w, dry, T.D. 1,880 ft., Cypress sand 1,680 ft., Ste. Genevieve 1,794 ft., McClosky 1,856-62 ft.

Posey County: Clark Nye et al 1 Klenck, NE NW 23-5s-12w, dry, T.D. 2,802 ft., Benoist 2,532 ft., Ste. Genevieve 2,639 ft., McClosky 2,712 ft.

OHIO

ZANESVILLE, Ohio.—Northwestern Ohio is to be given another deep test. The Ohio Oil Co. have a standard rig up ready to spud 10 miles east of Tiffin. The test is located in Seneca County, Scipio Township, SW Section 13 on the Harry Bishop farm.

Perry County continues as the major oil development. Guernsey County yields a fair shallow gasser.

OHIO COMPLETIONS

Ashland County, Lake Township: Lyons Co. 6 J. Heffelfinger, Sec. 15, 670,000 cu. ft. gas, shot, Clinton, T.D. 2,856 ft.

Ohio Fuel 1 Alfred Mosher, Sec. 23, dry, Clinton, T.D. 2,954 ft.

Gallia County, Greenfield Township: Portage Producers 22 Cambria Clay Products Co., Sec. 19, dry, Clinton, T.D. 3,020 ft.

Guernsey County, Oxford Township: M. J. Purdy 1 S. E. Christman, Sec. 18, 1,000,000 cu. ft. gas, Squaw, T.D. 1,006 ft.

Holmes County, Washington Township: Ohio Fuel 2 W. Young, Sec. 16, dry, Clinton, T.D. 2,966 ft.

Hocking County, Ward Township: Preston Oil 206 Sunday Creek Coal, Sec. 6, 30 bbl., shot, Clinton, T.D. 3,730 ft.

Knox County, Butler Township: Knox Exploration Co. 1 W. H. Fry, Sec. 3, 2,000,000 cu. ft. gas, Clinton sand topped at 2,710 ft., T.D. 2,765 ft.

Jackson Township: Shuff & Bucy 1 E. E. Hall, Sec. 8, 500,000 cu. ft. gas, shot, Clinton, T.D. 3,030 ft.

Medina County, Hinckley Township: Ohio Fuel 1 Nick Vantila, Lot 48, 1,060,000 cu. ft. gas, Clinton, T.D. 3,492 ft.

Meigs County, Rutland Township: H. M. Nelson 1 Alonza Smith, Sec. 27, 400,000 cu. ft. gas, Maxburg 800-ft. sand, T.D. 571 ft.

Muskingum County, Blue Rock Township: Industrial Gas Corp. 2 Z. M. Barkhurst, Sec. 33, dry through Clinton and Medina, T.D. 4,542 ft.

Wayne Township: Atha Realty Co. 1 P. Corbin heirs, Sec. 8, 68,000 cu. ft. gas, shot, plugged, Clinton 3,788-3,844 ft., T.D. 4,026 ft.

Perry County, Clayton Township: Palm Oil 6 Z. T. Lyons, Sec. 16, 70 bbl., shot, Clinton 3,317-46 ft., T.D. 3,351 ft.

Thorn Township: Preston Oil 1 Mary E. Lyle, Sec. 27, 55 bbl., shot, Clinton 2,735-63 ft., T.D. 2,771 ft.

Ohio Oil Co. 1 George M. Divan, Sec. 24, 50 bbl., shot, Clinton 2,840-68 ft., T.D. 2,892 ft.

Monroe Township: Ohio Fuel 211 Sunday Creek Coal, Sec. 9, 160,000 cu. ft. gas, Berea, shot, T.D. 991 ft.

Tuscarawas County, Sandy Township: Natural Gas W. Va. 1 Walter Esaly, Sec. 5, 340,000 cu. ft. gas, shot, Clinton, T.D. 4,461 ft.

Washington County, Grandview Township: Hanlon et al 1 C. Lehman, Sec. 2, 1 bbl., shot, Keener, P.B. to 1,634 ft., Ohio shales dry, T.D. 3,065 ft.

Wood County, Liberty Township: Nelson Pember et al 1 Shaw, SE SE NW Sec. 1, 150 bbl., drilled deeper in Trenton from 1,349 ft. to 1,365 ft. (top of Trenton 1,314 ft.).

EASTERN KENTUCKY

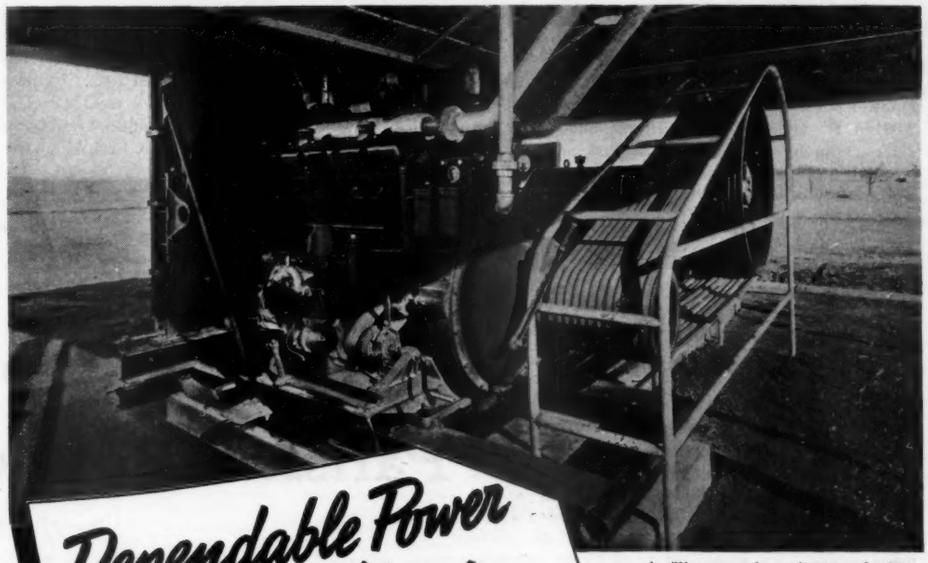
ASHLAND, Ky.—One oil well and a gas well were drilled in during this week as eastern Kentucky operations displayed a slight improvement.

A number of other wells are rapidly nearing the completion level and several locations were reported during the past few days.

Virginia Gasoline & Oil Co. 1 A. L. Moore in Martin County made 10 bbl.

Kentucky-West Virginia Gas Co. 5399 Elijah McKinney, on Branham Creek, Floyd County, made 158,000 cu. ft. of gas at 3,039 ft. in shale.

Reports from some of the fields indicate good progress under the spacing regulations and it is indicated that quite a few new locations may be made within the next few weeks. Cleaning out of several old wells is under way.



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TEXAS GULF COAST

Matagorda County Test Shows In Three Frio Sands

By F. L. SINGLETON

HOUSTON, Tex.—Ohio 1 McDonald, a wildcat located midway between the North Markham and Van Vleck fields, Matagorda County, which the previous week showed promise of production on a drill-stem test, is being prepared for a production test. Total depth of the well is 8,688 ft., and casing has been cemented preparatory to testing three sand sections in the Frio formation. Drill-stem testing the previous week recovered several hundred feet of pipe-line oil at 7,865-84 ft., while coring and electrical logging surveys showed possible production in two other sands at 8,031-81 ft., and 8,345-54 ft. In the meantime, the same company staked location for 1 McDonald-Account 2, 1,350 ft. east of the present well in the J. Bettes Survey. While the three sands correlate with those of Van Vleck and North Markham, the well is believed to open production on a separate structure.

Another extension to the Withers field, Wharton County, was indicated by Texas 1 G. A. Duffy, L. P. Ogden Survey, which is bottomed at 5,985 ft., and 5½-in. casing was cemented at 5,733 ft. The well is located ¾ mile west of the company's 1 Kluck, a dry-gas well.

In the South Mauritz area, recently opened by J. B. Coffee, the same operator's 1 Mauritz, 4,500 ft. northwest of the discovery well, was bottomed at 5,490 ft., and casing was expected to be cemented for a production test following a drill-stem test at 5,481-90 ft., which tested 102 lb. working pressure and recovered 5,100 ft. of pipe-line oil. The sand section was logged about normal with the discovery well, indicating that the producing area will extend over several hundred acres. In the meantime, another extension was indicated for the Harmon field as Gulfboard was testing 1 McCrory at 5,380-90 ft. The same company is preparing to drill 1-A Maggie Branch, 1,500 ft. south of the discovery well. Drilling operations in this field are being increased as Tide Water and Sun Oil Co. are scheduled to start drilling at an early date.

In the Rosenberg area, Fort Bend County, Magnolia Petroleum Co. and Placid Oil Co. 1 Huntington is bottomed at 8,902 ft., and 5½-in. casing was cemented at 8,898 ft. Side-wall cores and electrical surveys are reported to have showed possible production at 8,211 ft. and 8,800 ft. The well is located 1,200 ft. west of Magnolia 1 Huntington and about 3,000 ft. southeast of Placid 1 Moore, both of which are gas-distillate producers. Although several tests have been drilled in the area, the potentiality of the sector cannot be accurately measured due to excessive gas pressure which has resulted in several blowouts and has hindered the operations of producing wells.

Hampton Discovery Makes Good Flow

American Republics et al 1 Hampton-fee, the discovery well of the Hampton field, Hardin County, flowed 517 bbl. of 40-gravity oil on a potential test flowing through a ¼-in. choke. Tubing pressure was 850 lb., and casing pressure 1,150 lb. Production is from the Cockfield sand bottomed at 6,954 ft. The company is moving the rig over for 2 Hampton, 1,320 ft. southwest of the discovery well.

In the Deering Creek area, Montgomery County, Superior-Atlantic 1 McMahon, was being retested after two drill-stem tests recovered salt water. With the hole bottomed in the Wilcox at 12,480 ft., testing at 11,680-11,710 ft., and 11,690-11,705 ft., recovered salt water with a slight showing of gas. This is believed to be the lowest sand in the Wilcox that was logged, and additional sands up the hole are scheduled to be tested. However, details as to where the sands were logged are not available. To the west, and located as an outpost test, southwest of the Lake Creek field, Gray & Wolfe staked location for 1 Grogan-Cochran Lumber Co., a projected 10,300-ft. test located in the A. Prather Survey.

Two wildcats located along the updip sector of the Wilcox trend were being watched with much interest. Nine miles north of Trinity, British American 1 Texas Long Leaf Lumber Co., J. Ceballor Survey, topped the Wilcox at 2,380 ft., and was drilled to a total depth of 3,506 ft., where it was taken over by the Pan American Production Co. which will drill the well through the Wilcox section.

TEXAS GULF COAST COMPLETIONS

Wildcats

Angelina County: Coastal Refineries 1 Henderson, top Wilcox 1,323 ft., dry, T.D. 4,528 ft.

Harris County: British American 1 J. C. Street, top Discorbis 4,910 ft., large Discorbis 5,060 ft., Heterostegina 5,239 ft., round Marginulina 5,328 ft., flat Marginulina 5,387 ft., Frio 5,544 ft., dry, T.D. 6,530 ft.

J. H. Woodward 1 L. E. Griffith, dry, T.D. 4,288 ft.

Fields

Boling, Wharton County: Danciger 2 Hawes, 45 bbl., pumping, perf. casing 2,876-98 ft., T.D. 3,007 ft.

Citrus Grove, Matagorda County: Pure 1 Franzen, 324,000 cu. ft. gas, 5/64-in. choke, perf. casing 4,090-4,102 ft., T.D. 4,561 ft.

Fred, Tyler County: Stanolind 2 Parker, 181 bbl., ¼-in. choke, perf. casing 8,180-8,218 ft., T.D. 10,003 ft.

Hampton, Hardin County: American Republics et al 1 Hampton, 517 bbl., ¼-in. choke, sand 6,949-54 ft.

Port Neches, Orange County: Phillips 12 Stark, dry, T.D. 7,294 ft.

West Ganado, Jackson County: Pure 2 Havran, dry, T.D. 6,456 ft.

Withers, Wharton County: F. W. Michaux 53-A Pierce, 107 bbl., ⅞-in. choke, perf. casing 5,307-14 ft., T.D. 5,365 ft.

LOUISIANA GULF COAST

Wildcat Offshore From Iberia Parish Ready for Test

By F. L. SINGLETON

NEW ORLEANS, La.—Texas 3 State-Rabbit Island, a wildcat located offshore from Iberia Parish, in the Gulf of Mexico, was being prepared for a production test. Total depth is 9,348 ft., and casing is being cemented to test a gas sand at 8,670-8,700 ft. Several tests have been drilled by the company in the general area, but all were failures.

On the northeast flank of the Fausse Point dome, Iberia Parish, Texas 12 State is drilling ahead below 8,000 ft., after logging sand with a showing of oil at 8,658-8,745 ft. At the present time there are only three producing wells on this structure having a daily average production of 120 bbl.

Texas 2-B LeDanois Land & Stone Co., southwest flank of the Pine Prairie dome, Evangeline Parish, is reported to have logged a sand and shale section with a showing of oil in the Wilcox at 10,385-10,405 ft. This is the second sand section to be logged as an electrical log and side-wall cores recovered sand with an oil show in the Sparta formation at 9,462-93 ft. On the east flank of the structure, Pan American 1 Monsaur is reported to be flowing at the rate of 188 bbl. daily through a ⅛-in. choke from the 7,900-ft. sand. As a result of this completion, the company has plugged back 2 Monsaur which missed the pay and the hole will be sidetracked. Recent operations indicate that as development spreads out from the discovery area the sand becomes more faulted which definitely increases the hazards of drilling.

On the north side of the South Roanoke field, Jefferson Davis Parish, Union Sulphur 3 T. R. S. Farms, Inc., cemented casing at 10,624 ft., and is drilling ahead in shale below 10,800 ft. This is the first test to be drilled in the field by the company, and the casing was cemented as protection against high-pressure sands that have resulted in several attempted blowouts in previous tests.

In the Port Barre field, St. Landry Parish, Pan American 14 G. H. Garland is bottomed at 7,850 ft., and casing was cemented for testing. This is the third producer to be completed on this lease and enhanced further development in the Botany Bay lease, where Texas Co. has started drilling operations on 33 Botany Bay.

Gulf 1 S. S. Hunter, a flank test located on the Edgerly dome, Calcasieu Parish, has been abandoned at a total depth of 5,000 ft. The well is located in 22-9s-11w, about ½ mile south from shallow production. This is the second test to be abandoned by the company within recent weeks and it is doubtful if development will be continued.

Sun 1 State-Belle Isle, located on the Belle Isle dome, St. Mary Parish, is reported to have been abandoned at a depth of 12,012 ft., after electrical survey and side-wall cores failed to log any showings of oil or gas. Production around this old structure is limited to one gas-distillate producer which is flowing from a depth of 9,800 ft.

LOUISIANA GULF COAST COMPLETIONS

Wildcats

Orleans Parish: W. T. Burton 1-A L.&N.R.R., dry, T.D. 9,870 ft.

Pointe Coupee Parish: Humble 1 Pointe Coupee Land & Improvement Co., dry, T.D. 11,252 ft.

Fields

Edgerly, Calcasieu Parish: Gulf 1 Sulphur Mining Co., dry, T.D. 9,856 ft.

Gueydan, Vermilion Parish: Fohs 2 Evans, 583 bbl., ¼-in. choke, perf. casing 9,742-57 ft., T.D. 9,808 ft.

Lirette, Terrebonne Parish: Humble 3 Ellender, 197 bbl., 1-in. choke, perf. casing 8,405-25 ft., T.D. 11,563 ft.

Paradis, St. Charles Parish: Texas 5 Sunset Realty Co., 486 bbl., ⅞-in. choke, perf. casing 10,075-10,100 ft., T.D. 10,300 ft.

Richland County Pool Opener Flowing From McClosky

MATTOON, Ill.—More than half of the drilling operations in the Illinois basin were halted during the past week by rain and mud and operators were discouraged by the loss of time remaining before the issuance of an expected government order to supersede M-68.

Despite the slowness of activity there were a few important developments in the basin. Outstanding among these was the Gulf, Helmerich & Payne 1 Stiff heirs, 1 mile east of the village of Dundas in the SE NE NE 35-5n-10e, Richland County, which flowed at the rate of 17 bbl. an hour following a 1,000-gal. acid treatment in the McClosky at 3,007-11 ft. The well, a pool opener, started flowing at the rate of 10 bbl. an hour immediately after the acid but several hours later its output had increased to 17 bbl. an hour.

New Coles County Pool in Prospect

The Cooks Mills area of Coles County expected a new pool when Ruwaldt & Bayer announced 1 Moore, E½ SE NE 34-14n-7e, probably would swab at the rate of about 200 bbl. daily. Storage was being erected and offset locations are expected in the next few days. About 425 ft. of oil rose in the hole at the Moore test following a shot. It has not yet been decided whether production was from the Aux Vases or Rosiclare.

ILLINOIS COMPLETIONS

Wildcats

Bond County: Sinclair-Wyoming 1 Murray, NE NE NE 31-4n-1w, dry at 1,630 ft., Glen Dean 1,095 ft., Cypress 1,238 ft., Weiler 1,268 ft., Benoist 1,381 ft., Ste. Genevieve 1,510 ft., St. Louis 1,616 ft.

H. A. Hoffman 1 Wilson, NW NE 24-4n-3w, 1,000,000 cu. ft. gas, Paint Creek 1,095 ft., gas 1,112-20 ft., T.D. 1,124 ft., *pool opener.*

W. C. McBride 1 Jacobs, SE SW NW 31-4n-2w, pumped 24 bbl. oil and 28 bbl. water, perf. 1,196-1,208 ft., 5-qt. shot 2,449-56 ft., Chattanooga 2,455 ft., hard sand 2,449 ft., T.D. 2,526 ft., P.B. 2,465 ft., *pool opener.*

Clay County: Nat. Pet. et al 1 Hinterscher, NW SE SE 10-4n-8e, pumped 5 bbl. oil and 28 bbl. water, perf. 3,096-3,110 ft., 2,958-67 ft., 2,925-35 ft., 2,500 gal. acid, McClosky 3,098-3,100 ft., Rosiclare 2,970 ft., Aux Vases 2,914 ft., T.D. 3,138 ft., *pool opener.*

Clinton County: T. M. Conrey 1 Rhoda Riddle, NE NE SW 22-3n-2w, dry at 1,454 ft., Glen Dean 990 ft., Golconda 1,030 ft., Paint Creek 1,260 ft., Benoist 1,300 ft., Ste. Genevieve 1,365 ft., Fredonia 1,415 ft.

F. E. Webb et al 1 Boeker, NW SE NE NE 12-1n-2w, dry at 105 ft.

Coles County: E. C. Baker et al 1 Cox, SE NE SE 3-13n-7e, dry at 1,856 ft., Glen Dean 1,492 ft.

Effingham County: Jablonski 1 Barnick, NE NW 36-6n-6e, location abandoned.

A. H. Gibson 1 Cambell, NW NE 10-6n-5e, dry at 2,544 ft., Kincaid 1,700 ft., Palestine 1,745 ft., Menard 1,800 ft., Tar Springs 1,916 ft., Glen Dean 2,017 ft., Golconda 2,063 ft., Barlow 2,159 ft., Benoist 2,319 ft., Aux Vases 2,376 ft., Ste. Genevieve 2,438 ft., McClosky 2,478 ft., St. Louis 2,539 ft.

Ohio 1 Bogt, SE NE NE 1-7n-5e, dry at 2,629 ft., Glen Dean 1,956 ft., Hardinsburg 1,988 ft., Golconda 2,002 ft., Cypress 2,085 ft., Weiler 2,110 ft., Renault 2,272 ft., Aux Vases 2,315 ft., Ste. Genevieve 2,387 ft.

Gallatin County: Skelly 1 M. Hogue, SE NW SE 15-8-9e, dry at 2,990 ft., Palestine 1,953 ft., Menard 2,012 ft., Waltersburg 2,116 ft., Vienna 2,168 ft., Tar Springs 2,190 ft., Glen Dean 2,295 ft., Hardinsburg 2,377 ft., Barlow 2,504 ft., Cypress 2,518 ft., Weiler 2,545 ft., Paint Creek 2,613 ft., Benoist 2,644 ft., Renault 2,726 ft., Aux Vases 2,804 ft., McClosky 2,952 ft.

Hamilton County: Cameron 1 Roth, SW NE 4-6s-6e, dry at 3,144 ft., Glen Dean 2,539 ft., Hardinsburg 2,655 ft., Barlow 2,775 ft., Cypress 2,815 ft., Paint Creek 2,955 ft., Renault 3,065 ft., Aux Vases 3,115 ft.

Jasper County: J. L. England et al 1 Louis Reis, E½ SW NW 32-6n-14w, location abandoned.

Jefferson County: Cameron Bros. 1 Hertenstein, NW NE NE 19-2s-3e, dry at 2,780 ft., Hardinsburg 2,173 ft., Barlow 2,342 ft., Cypress 2,343 ft., Paint Creek 2,436 ft., Benoist 2,504 ft., Renault 2,555 ft., Aux Vases 2,584 ft., Ste. Genevieve 2,626 ft., Fredonia 2,676 ft., McClosky 2,711 ft.

Lewis Prod. 1 Game Preserve, SW SW SE 21-3s-3e pumped 155 bbl. oil and 32 bbl. water, natural, Aux Vases 2,740 ft., T.D. 2,762 ft.

R. B. Martin 1 Jeff O. & G., SW SW NE 10-4s-2e, dry at 2,831 ft., Kincaid 1,678 ft., Degonia 1,695 ft., Palestine 1,808 ft., Menard 1,921 ft., Waltersburg 1,969 ft., Vienna 2,024 ft., Tar Springs 2,093 ft., Glen Dean 2,136 ft., Hardinsburg 2,244 ft., Barlow 2,350 ft., Cypress 2,366 ft., Benoist 2,561 ft., Renault 2,600 ft., Aux Vases 2,649 ft., Rosiclare 2,739 ft., Fredonia 2,761 ft., McClosky 2,808 ft.

Lawrence County: First Nat. Bank & Trust Co. of Alton 1 Scott Gray, SE SE SW 7-4n-10w, dry at 1,600 ft., Barlow 1,309 ft., Cypress 1,354 ft., Benoist 1,402 ft., Ste. Genevieve 1,445 ft., McClosky 1,503 ft.

Marion County: T. R. Buell et al 1 T. E. Robb, SW SE NW 19-4n-3e, dry at 2,169 ft., Golconda 1,676 ft., Barlow 1,724 ft., Cypress 1,743 ft., Paint Creek 1,868 ft., Benoist 1,912 ft., Renault 1,951 ft., Aux Vases 1,961 ft., Ste. Genevieve 2,040 ft., Fredonia 2,076 ft.

Perry County: Texas 1 W. Malinski, SE SE SE 1-5s-2w, dry at 3,087 ft., Menard 717 ft., Tar Springs 845 ft., Glen Dean 922 ft., Golconda 1,000 ft., Cypress 1,129 ft., Weiler 1,144 ft., Paint Creek 1,235 ft., Benoist 1,311 ft., Renault 1,360 ft., Aux Vases 1,371 ft., Ste. Genevieve 1,495 ft., St. Louis 1,658 ft., Salem 1,853 ft., Chattanooga 2,865 ft., Devonian 2,889 ft.

Richland County: Pure 2-B W. G. Murvin, SW NW 22-4n-9e, dry at 3,063 ft., Glen Dean 2,450 ft., Barlow 2,598 ft., Weiler 2,692 ft., Paint Creek 2,808 ft., Benoist 2,838 ft., Aux Vases 2,898 ft., Ste. Genevieve 2,965 ft., McClosky 3,037 ft.

St. Clair County: Walter Payne 1 W. Ehlers, W½ NW NE 24-1s-10w, dry at 1,097 ft., Fredonia 95 ft., St. Louis 215 ft., Osage 495 ft., Devonian 750 ft., Maquoketa 860 ft., Trenton 983 ft.

Saline County: Sinclair-Wyoming 1 Garner, W½ SW SW 26-7s-7e, dry at 3,154 ft., Kincaid 1,733 ft., Degonia 1,878 ft., Clore 1,936 ft., Menard 2,072 ft., Waltersburg 2,174 ft., Vienna 2,238 ft., Hardinsburg 2,395 ft., Golconda 2,445 ft., Barlow 2,608 ft., Cypress 2,615 ft., Weiler 2,668 ft., Benoist 2,776 ft., Renault 2,872 ft., Aux Vases 2,898 ft., Ste. Genevieve 2,992 ft., McClosky 3,116 ft., St. Louis 3,142 ft.

Wayne County: Texas 1 G. Scott, N½ SW SE 7-3s-6e, dry at 3,875 ft., Menard 2,410 ft., Tar Springs 2,537 ft., Glen Dean 2,639 ft., Golconda 2,762 ft., Barlow 2,884 ft., Cypress 2,908 ft., Paint Creek 3,038 ft., Renault 3,180 ft., Aux Vases 3,194 ft., Ste. Genevieve 3,263 ft., Rosiclare 3,294 ft., McClosky 3,342 ft.

Harvey Sims 1 Malone, W½ SE SE 27-1s-6e, dry at 3,250 ft., Glen Dean 2,584 ft., Golconda 2,689 ft., Barlow 2,797 ft., Renault 3,074 ft., Aux Vases 3,083 ft., Ste. Genevieve 3,147 ft., Rosiclare 3,164 ft., Fredonia 3,192 ft., McClosky 3,209 ft.

White County: Sinclair-Wyoming 1 Doerner, SW SW NW 7-7s-9e, dry at 3,154 ft., Kincaid 1,914 ft., Degonia 1,939 ft., Clore 2,018 ft., Palestine 2,092 ft., Menard 2,130 ft., Waltersburg 2,203 ft., Vienna 2,273 ft., Tar Springs 2,297 ft., Glen Dean 2,383 ft., Golconda 2,511 ft., Barlow 2,616 ft., Cypress 2,629 ft., Paint Creek 2,744 ft., Benoist 2,790 ft., Renault 2,860 ft., Aux Vases 2,880 ft.

Fields

Boulder, Clinton County: Texas 5 Gray Comm., SW SE SE 35-3n-2w, swabbed 217 bbl., 10-qt. shot 1,216-26 ft., Benoist 1,202 ft., T.D. 1,230 ft., P.B. 1,228 ft.

Coil, Wayne County: Armstrong & Day 1 Edmonson-Ellis, NW SW 17-1s-5e, dry at 2,956 ft., Kincaid 2,016 ft., Menard 2,260 ft., Glen Dean 2,450 ft., Golconda 2,539 ft., Barlow 2,643 ft., Cypress 2,675 ft., Benoist 2,874 ft., Renault 2,928 ft., Aux Vases 2,947 ft.

Dale, Hamilton County: Texas 2 M. P. Logan, NW NW SW 31-5s-7e, dry at 3,063 ft., Glen Dean 2,436 ft., Hardinsburg 2,520 ft., Golconda 2,610 ft., Barlow 2,730 ft., Weiler 2,796 ft., Benoist 2,953 ft., Renault 2,983 ft., Aux Vases 3,044 ft.

Dundas, Jasper County: Schulman Bros. 1 Harvey (King), E½ SE SW 7-5n-10e, pumped 200 bbl., perf. 2,778-79 ft., 2,780-84 ft., 5,000 gal. acid, McClosky 2,845-49 ft., 2,868-74 ft., T.D. 2,878 ft.

Roy Powers 1 Harvey, E½ SE NW 7-5n-10e, pumped 196 bbl., 2,000 gal. acid, McClosky 2,853-62 ft., T.D. 2,863 ft.

Pure 1 Cunningham, NE SW 5-5n-10e, pumped 140 bbl., 5,000 gal. acid, McClosky 2,793-98 ft., 2,810-13 ft., 2,815-17 ft., T.D. 2,827 ft.

Dundas, Richland County: Pure 1-A E. Hoel, W½ NW NE 12-4n-9e, pumped 27 bbl., natural, Cypress 2,565-2,636 ft., T.D. 2,640 ft.

Fairfield, Wayne County: H. H. Weinert 1 Syncott Comm., E½ NE NE 11-2s-7e, pumped 15 bbl. oil and 200 bbl. water, natural, McClosky 3,318-29 ft., T.D. 3,330 ft.

Flora, Clay County: David Goodson et al 1 Nash, E½ NW SE 12-3n-6e, dry at 3,007 ft., Glen Dean 2,426 ft., Golconda 2,514 ft., Barlow 2,604 ft., Cypress 2,625 ft., Paint Creek 2,793 ft., Benoist 2,810 ft., Aux Vases 2,871 ft., Ste. Genevieve 2,950 ft., Rosiclare 2,962 ft., Fredonia 2,970 ft.

Griffin, White County: Longhorn 29 Helm, SW NW SE 22-3s-14w, pumped 200 bbl., perf. 2,505-11 ft., 2,553-84 ft., 2,764-74 ft., Aux Vases 2,764-74 ft., Cypress 2,504-11 ft., Weiler 2,582-92 ft., T.D. 2,781 ft.

Hoodville, Hamilton County: J. W. Menhall 1 A. B. Anderson, SW NW SE 11-6s-6e, dry at 3,255 ft., Glen Dean 2,448 ft., Cypress 2,766 ft., Benoist 2,974 ft., Aux Vases 3,034 ft., Ste. Genevieve 3,100 ft.

Inman, Gallatin County: Phillips 8 Egyptian Tie & Timber, SW NE NE 16-8s-10e, pumped 18 bbl. oil and 150 bbl. water, perf. 1,838-49 ft., old well worked over, T.D. 1,850 ft.

Carter 2 Jordan, NE SE NE 21-8s-10e, dry at 2,908 ft., Weiler 2,443 ft., Paint Creek 2,517 ft., Benoist 2,538 ft., Renault 2,638 ft., Aux Vases 2,681 ft., Aux Vases sand 2,730 ft., Ste. Genevieve 2,748 ft., McClosky 2,797 ft., St. Louis 2,902 ft.

Skelly 1 Egyptian Tie & Timber, NE NW NE 21-8s-10e, pumped 210 bbl. oil and 36 bbl. water, natural, Waltersburg 1,979 ft., T.D. 2,002 ft.

Mason, Effingham County: E. F. Jones 3 Leith, NE SW NW 27-6n-5e, dry, old well deepened from 2,337-2,450 ft., Benoist 2,290 ft., Aux Vases 2,362 ft., McClosky 2,439 ft.

C. E. Pearson et al 1 Wright, SE SW NE 27-6n-5e, dry at 2,500 ft., Glen Dean 1,998 ft., Cypress 2,162 ft., Weiler 2,204 ft., Benoist 2,310 ft., Renault

(Continued on Page 67)

MICHIGAN OPERATIONS

Allowables Reduced Because of Rapid Pressure Drop

By OTTO C. PRESSPRICH

SAGINAW, Mich., June 29.—Reports of loss of well-head pressure under eased production regulation prompted the state Conservation Commission to reduce withdrawal limits, effective July 1, from Michigan oil wells in prorated fields.

The department's geology staff prepared the order and P. J. Hoffmaster, supervisor of wells, directed that the order be drawn in accordance with recommendations of the state Oil Advisory Board after F. R. Frye, state petroleum engineer, reported the operators' reaction.

The board recommended that output from wells in 10 and 20-acre drilling units be cut to 150 bbl. a day, a 20-bbl. reduction, and that withdrawals in 40-acre units be set at 262½ bbl., a 30-bbl. cut. In recent months proration limits in the state's bigger fields had been eased to meet a demand for more production as the months rolled by without important new discoveries.

Last week's developments brought six new oil wells, two more natural-gas completions and 10 dry holes. Two locations were abandoned. Six of the dry holes were wildcat tests, including one drilled beyond the Niagara formation to a depth of 5,363 ft. in Watertown Township, Clinton County.

Some bright spots appeared in the picture. In Section 22 of Osceola Township, Osceola County, Sun Oil Co. was acidizing 1 Wirth, west offset to the Evart discovery and which gave promise of being a good well. At the same time Ervin Major was completing a deep producer in Adams-Arenac. In Section 25, the 1 White is a north offset to a discovery a mile from the old field. It was being acid treated after a good natural show. Interest also attached to Louis Rose's 1 Twin Lakes in Section 16, Sauble Township, Lake County. East offset to the Shoemaker wildcat producer, it was believed capable of better than 20 bbl. a day, before acidizing. Two other offsets were dry.

MICHIGAN COMPLETIONS

Allegan County, Allegan Township: Bridger-Basin Oil Corp. 1 Butcher, NW NE NW 26-2n-13w, pumping 20 bbl. and salt water, acidized, T.D. 1,455 ft.

Hopkins Township: Devonian Testing & Leasing Co.

(Continued on Page 68)

Discoveries in Los Angeles Basin Fail to Maintain Reserves

(Continued from Page 55)

Meyer and some other zones found productive at Santa Fe Springs were also logged at Buena Park but were too thin to produce commercially. The two wells now being drilled should tell the story of what has been found and how important the discovery may be. One of these new wells is being drilled west of the discovery well and the other is being drilled east of the initial success so a good cross-section should be available from their logs.

Future Possibilities

The Buena Park structure, plunging toward the west, presents a number of interesting possibilities and it was on some such assumptions that prospecting work was undertaken. The westerly plunging nose is plunging toward the area of greatest Pliocene thickness and for this reason it is quite possible that a low point structurally in the western end of the anticline may show larger production than wells located structurally higher. The Pliocene section thins out as it approaches the eastern rim of Los Angeles Basin and reaches its maximum thickness near Santa Fe Springs and out in the center of the basin. The highest structural point on the Buena Park anticline will be in the eastern end of the nose and the lowest structural point will be to the west but it is believed quite possible that the thickening of the Pliocene section to the west will more than offset the less favorable position with respect to structure. Another few weeks should tell the story of Buena Park, California's first and only discovery in Los Angeles Basin during 1942 up to date.

It is rather difficult to evaluate the possibilities of Los Angeles Basin but it appears logical to assume that few major discoveries will be made in the future unless a new line of folding is found in the central part of the basin. New discoveries can, of course, be anticipated from time to time but these are expected to be local in character. Buena Park field suggests the possibility of a new line of folding buried deep beneath surface formations.

There has been a noticeable tendency during the past year to move into areas around the rim of the basin and to extend the scope of work into areas that have not always been regarded as favorable for the accumulation of oil and gas. Union Oil Co., for instance, has located a wildcat in the Chino quadrangle in San Bernardino County. This wildcat is considerably farther east than any productive area in Los Angeles Basin and for this reason will mean much if large production is secured. Previous exploration work in this region has indicated the presence of small production of heavy oil but commercial possibilities are doubtful. Relatively shallow drilling will be required and for this reason the area presents some merit.

A wildcat will be drilled at some time in the future in the area between El Segundo and Playa Del Rey but this exploration work may be several years away. Reference is made to the Rancho Sausal Redondo aggregating 1,300 acres and which was purchased in 1937 by a joint group consisting of Standard Oil Co., Texas Co., Shell Oil Co., Inc., Union Oil Co. and Tide Water Associated Oil Co. This acreage was purchased in fee for approximately $900,000 which is approximately $700 per acre. This represents a fair valuation of the acreage for general purposes. No single operator was willing to gamble $900,000 and the acreage was taken jointly and will undoubtedly be developed as a unit. The area has some merit and if production is developed it will probably be schist-conglomerate similar to the productive measures in the Playa Del Rey field.

The proposal of J. E. Elliott and Shell Oil Co., Inc., to prospect for deep sand production in the old Salt Lake field of Los Angeles Basin provided permission is secured from the Los Angeles city council could be considered a new wildcat play from a broad standpoint because the property projected for deep zone development has been abandoned for a number of years. Action on this proposal requires early decision because the Metropolitan Life Insurance Co. is erecting a $10,000,000 home project on part of the acreage and will use part of the land for buildings if permission is denied. From a geological standpoint there is every reason to believe that deep zone production might be developed in the Miocene. Secretary of the Navy Frank Knox recently sent a letter addressed to the Los Angeles city council endorsing the project in which he called attention to the fact that "the needs of the armed forces of the United States and war production industries in the Pacific area for petroleum products make it imperative that all possible sources of new production be examined in an effort to increase California oil reserves. For this reason the Navy Department wishes to support the application for the authority requested." The plan advocated for development of the Gilmore Island section contemplates erection of a high vaporproof building to enclose derricks and drilling equipment and use of directional drilling to intercept the pay beneath existing or contemplated buildings. No one has yet proposed to drill a deep test in the old Los Angeles city field where most geologists believe a major field exists but this may come later if the present attempt to resume drilling in the Salt Lake field is successful.

Yorba Linda Field

Shell Oil Co., Inc., has a new field in the Yorba Linda quadrangle but its potentiality has not been definitely determined as only one well has been completed to date and operations were suspended immediatly upon completion of the well in question. This field which is being held back is located on the Olinda Land property and the discovery was made through the instrumentality of core-hole drilling. Shell made a deal with the Olinda Land Co. which provided that Shell would be permitted to drill a wildcat and if oil was found in commercial quantity Shell would purchase the fee acreage for $500,000. Shell started several comparatively shallow core holes and core hole *F* hit the pay in December 1937. The well was not tested until February 1938, and at this time the gage showed the well flowing at a daily rate of 766 bbl. of 20.2-gravity oil cutting 1.4 per cent and 276,000 cu. ft. of natural gas. Shell's core hole *F* was drilled to 2,396 ft. but was plugged back to 2,325 ft. prior to completion. Because Shell suspended operations immediately upon completion of core hole *F* very little data is available concerning the accumulation or structure. The only thing certain is that Shell paid the purchase price asked for the land, took possession of its fee acreage, has one well capable of producing and a field of undetermined potentiality.

Deep zone possibilities of the West Coyote field of Orange County should be known by the time this gets into print if Standard Oil Co. proceeds with its present deep zone exploratory well now under way. Standard's deep test in the West Coyote field is 129 Murphy-Coyote which recently passed 9,000 ft. This deep drilling is being done to determine if there are any more productive zones in the Pliocene and whether there are any productive zones present in the Miocene. No Miocene production has been developed in this field up to the present and if this test proves productive it will substantially increase the proved reserves of the field and state.

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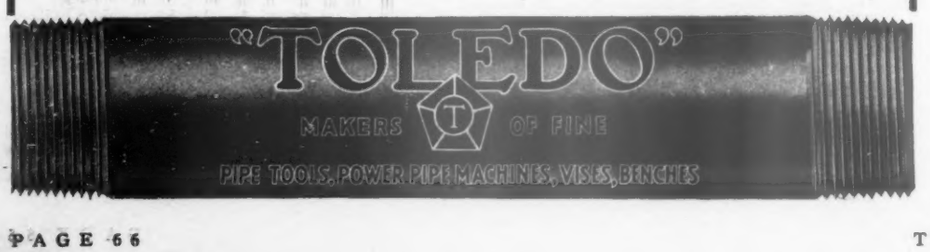


New Mississippi Lime Pool Is Opened in Greenwood County

By CARL HOOT

COMPLETIONS in Kansas were down approximately a third over the previous week, although drilling and permits for new wells continue at an even pace. New production was found in southeastern Greenwood County. LeBlanc 1 Shell, NW SW 28-27-12, pumped 10 bbl. of oil a day from Mississippi lime at 1,640-49 ft. It is about midway between the Brinegar and Severy pools.

Peace Creek Pools Combined

At a recent meeting of the Kansas Nomenclature Committee, pools along the 7-mile Viola lime trend play comprising Southwest Peace Creek, Peace Creek, Hendrickson and Schweizer were combined under the name Peace Creek. Completions in the original Peace Creek area have slowed to normal with only 1 extension reported. Attention was focused on the Hendrickson area of the pool where edge wells extended the field east, south and west. Transwestern Oil 1 Withroder, SE SW NW 1-23-10w, was the east well, flowing 44 bbl. an hour through choke. The south and west wells were Cities Service 4-A Hinshaw, SW SW SE and 5-A Hinshaw, NW SW 2-23-10w, which made 99 and 171 bbl. a day, respectively.

New Horizon in Old Pool

In the Whelan pool of Barber County, Great Lakes Carbon Corp. 1 Swartz, NW SE 31-31-11w, which was originally dry at 4,619 ft. in the Simpson, plugged back to 3,327 ft. and gaged 3,900,000 cu. ft. of gas in the Elgin sand topped at 3,312 ft. This is an old area and production is mostly from Mississippian chat found at 4,355 ft.

KANSAS COMPLETIONS

Wildcats

Cowley County: Continental 1 McKnab, SW SW NE 31-30-5, dry, T.D. 3,391 ft., Bartlesville sand 2,865 ft., Mississippi lime 2,925 ft., Arbuckle 3,377 ft.

Edwards County: Stanolind 1 Boyd, SW SW SE 1-23-19w, dry, T.D. 5,035 ft., anhydrite 1,283 ft., Dodge 3,840 ft., Lansing 3,871 ft., base Kansas City 4,175 ft., conglomerate 4,408 ft., Viola 4,765 ft., Arbuckle 4,971 ft.

Ellis County: A. H. Witt 1 fee, N½ NE NE 29-14-19w dry, T.D. 3,787 ft., Lansing 3,466 ft., base Kansas City 3,725 ft., conglomerate 3,769 ft., Arbuckle 3,781 ft., at T.D. bailed ½ bbl. oil an hr.

Greenwood County: LeBlanc 1 Shell, NW SW 28-27-12, pumped 10 bbl., Mississippi lime 1,640-49 ft.

Kingman County: Falcon-Seaboard et al 1 Beshore, E½ SE SW 29-28 5w, dry, T.D. 4,332 ft., Topeka 2,475 ft., Lansing 3,045 ft., base Kansas City 3,745 ft., Mississippi lime 3,893 ft., Viola 4,291 ft., Simpson sand 4,311 ft., show oil 3,903 ft., show dead oil 4,295 ft.

McPherson County: W. C. McBride 1 Hanson, S½ SE NW 10-17-1w, dry, T.D. 2,733 ft., Mississippi lime 2,722 ft.

Russell County: Hartman & Blair 1 Boxberger, SW SW NE 4-14-14w, dry, T.D. 3,291 ft., Topeka 2,720 ft., Lansing 3,000 ft., Gorham sand 3,275 ft., Arbuckle 3,287 ft.

Fields

Beaumont, Greenwood County: K. T. Wiedeman 2-D Lewis, SE SE 26-27-8, pumped 35 bbl. in 1 hr., Mississippi lime 2,461-68 ft.

Bornholdt, Rice County: Westgate-Greenland 1 Johnson, S½ SE NW 24-20-6w, pumped 15 bbl., Mississippi lime 3,262-3,318 ft.

Fairport, Russell County: Stanolind 3-B Both, W½ SW NE 29-11-15w, pumped 324 bbl., Arbuckle 3,120-30 ft., T.D. 3,345 ft.

Gorham, Russell County: Wolf Creek 4-A Rouback, E½ SE NE 15-14-15w, pumped 311 bbl., Gorham sand 3,262-63 ft.

Henne, McPherson County: W. C. McBride 1-B Anderson, S½ SW SW 16-17-1w, 3,000 bbl., Mississippi lime 2,626-38 ft.

Kraft-Prusa, Barton County: Skelly 7 Esfield, S½ NW NE 30-16-11w, flowed 75 bbl. in 6 hr., Lansing 3,035-45 ft., T.D. 3,288 ft.

J. J. Lynn 1-A Smith, S½ NE NW 1-17-11w, dry, T.D. 3,430 ft.

Lindsborg, McPherson County: Dickey Oil 1 Rundberg, W½ NW NE 19-17-3w, pumped 891 bbl., Viola 3,358-63 ft.

Lost Springs, Marion County: Derby Oil and Crow Drlg. 1 Watson, SE SE 29-17-4, flowed 411 bbl., Mississippi lime 2,393-2,407 ft.

McLough, Leavenworth County: McLaughlin 1 Borst, C W½ E½ 1-10-20, dry, T.D. 1,502 ft., show oil 1,425-30 ft., Mississippi lime 1,473 ft.

McLaughlin 1 Watson, NE NW 12-10-20, est. 3,000,000 cu. ft. gas, McLough sand 1,356-65 ft.

Peace Creek, Reno County: Cities Service 3-A Kreie, SW SW NE 28-23-10w, dry, T.D. 3,815 ft., Viola 3,799 ft.

Transwestern Oil 1 Withroder, SE SW NW 1-23-10w, flowed 44 bbl. an hr. through 1-in. choke, Viola 3,706-25 ft.

Cities Service 4-A Hinshaw, SW SW SE 2-23-10w, flowed 99 bbl. in 7 hr., Viola 3,748-61 ft.

Cities Service 5-A Hinshaw, NW SW 2-23-10w, pumped 171 bbl., Viola 3,736-60 ft.

Raymond, Rice County: Anderson-Pritchard 1-B Yeo, N½ SW NE 30-20-10w, pumped 23 bbl., Lansing 3,069-74 ft., T.D. 3,314 ft.

Stafford, Stafford County: Stanolind 1 Rolfs, W½ NE NW 15-24-12w, dry, T.D. 4,037 ft.

FOREST CITY BASIN

ST. JOSEPH, Mo.—Skelly Oil Co. has cemented surface pipe in its Northwest Missouri wildcat, 1 Mutual Benefit, 4 miles east of Oregon in E½ SE SE 32-60n-37w, Holt County, Missouri. The region lies about 30 miles east and a little south of the Falls City, Neb., pool. Skelly has a solid block of 3,700 acres and the location is in the approximate center. Immediately to the northwest is a Carter Oil Co. block of over 2,400 acres in extent. Extending virtually around the Skelly block is acreage held by F. C. (Bob) Miller, who assembled the Skelly block. Miller's acreage is almost as great as Skelly's.

In the Nebraska sector of the Forest City basin Skelly Oil Co. was drilling plug for a test of Viola lime at 1 Smith in E½ SE SE 3-1n-14e, in the Dawson pool of Richardson County. The lime was topped at 2,886 ft. and had a show of oil. At 1 Wiltse in the same pool, in E½ NW SE 10-1n-14e, the company perforated casing opposite Hunton lime and acidized, with little response. A squeeze job was scheduled. Brown & Clampitt were producing some oil from the Hunton at 1 Cornelius in E½ SE NE 4-1n-14e of the Dawson pool, but intended to reperforate.

Illinois Fields

(Continued from Page 65)

2,358 ft., Aux Vases 2,375 ft., Ste. Genevieve 2,430 ft., McClosky 2,463 ft.

North Allendale, Lawrence County: W. R. White 1 A. Herchey, SE SW SE 27-2n-12w, pumped 126 bbl., natural, Benoist 2,014 ft., T.D. 2,204 ft., P.B. 2,023 ft.

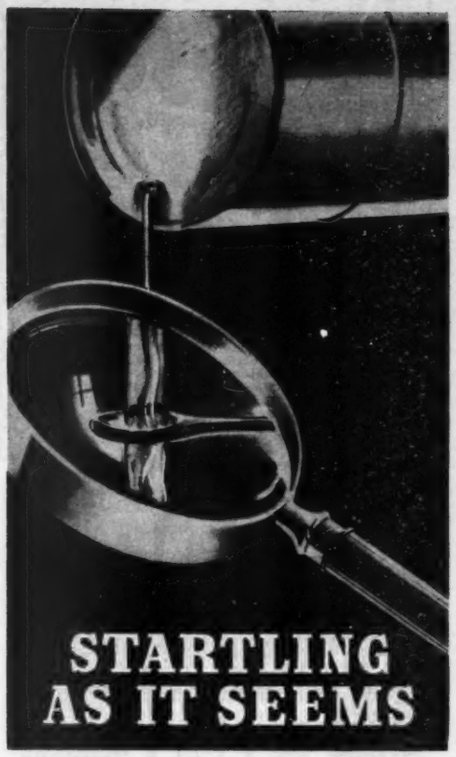
Phillipstown, White County: Jarvis Bros. 2 Spencer, N½ NW SW 31-4s-11e, pumped 30 bbl. oil and 70 bbl. water, 10-qt. shot 2,054-57 ft., Palestine 2,052 ft., T.D. 2,120 ft., P.B. 2,057 ft.

Roland, White County: Carter 1 L. E. Edwards, SW NW 15-7s-8e, flowed 242 bbl., 15-qt. shot 2,191-97 ft., Waltersburg 2,187 ft., T.D. 2,000 ft.

St. Jacob, Madison County: M. D. Bryant et al 1 Becker heirs, SW NW SE 16-3n-6w, pumped 127 bbl., natural, Trenton 2,308 ft., pay 2,366-87 ft., T.D. 2,387 ft.

St. Paul, Fayette County: Luttrell et al 2 Hollman, SE NE SW 30-5n-3e, pumped 15 bbl., natural, Benoist 1,908-16 ft., Paint Creek lime 1,882 ft., T.D. 1,916 ft., P.B. 1,907 ft.

Siggins, Clark County: C. R. Craft 1 Imle, NE SW 7-10n-11e, dry at 2,623 ft., Carper 2,290 ft., Osage 1,804 ft., St. Louis 2,358 ft., Chattanooga 2,367 ft., Devonian 2,477 ft.



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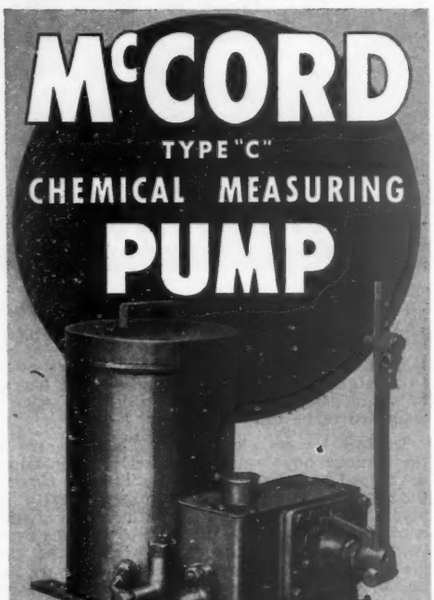

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ROCKY MOUNTAIN AREA

Oregon Basin Field Gets Three Good Producers

By T. R. INGRAM

DENVER, Colo. — Three completions on the south dome of the Oregon Basin black oil are reported. Kirk Oil Co. 2 Conaghan flowed 130 bbl. an hour from the Embar at 3,344-73 ft. after acidizing with 1,000 gal. It quit soon after and pump was installed. Upon being agitated it resumed flowing. After running tubing and installing valves, it made 400 bbl. The flow will be further reduced to 300 bbl. a day. It did not go into the Tensleep. Oil is 20.8 gravity on the A.P.I. scale. The well is on Unit 4, a 160-acre tract on which the company purchased a lease from the Government last January for $610 an acre bonus and is the first well drilled on the lease. It is located north of a major fault traversing the south dome.

Yale Oil Corp. 1 Government, a diagonal offset on the northwest of the Kirk well, also was completed in the Embar without going into the Tensleep and made 480 bbl. This well also is on a 120-acre tract purchased at auction last January for $505 an acre by the Yale corporation.

The third well is south of the major fault where there has been comparatively little development and where production is not as large as to the north. However, Enalpac Oil & Gas Co. 3 McMahon flowed 400 bbl. at 3,570-74 ft., and through perforations opposite the Embar, which is much better than its east offset which was completed last fall for 220 bbl. a day on the pump. This tract was entered years ago under the old placer mining laws and was not included in the January sale.

Midway Test Has Show in Sunburst

R. C. Tarrant's test to the Devonian in the Midway district, Pondera County, Montana, 1 Wood, NE NW 32-28n-1w, on a block of 16,000 acres, had the Sunburst sand at 1,690-1,720 ft. It had a show of 43° oil in the first 10 ft. of sand which bailed 1½ bbl. in 2 hours. It then ran into some water, about enough for drilling purposes, at 1,710-20 ft., and is drilling ahead at 1,730 ft. The Madison is expected at around 1,925 ft., and based on an estimated thickness of 800 ft., the top of the Devonian is expected at 2,750 ft. It is the first Devonian test to be drilled in the central part of the Sweetgrass arch.

Barker Dome Test

Southern Union Production Co. has made a location for 3 Ute Indian lease, SW SW 21-32n-14w, Barker dome, Northwest New Mexico, more than ½ mile southwest of No. 2 completed last month for an estimated flow of 10,000,000 cu. ft., and which is still waiting for official gaging by representatives of the Geological Survey. No. 2, in turn, is ½ mile east of No. 1, which gaged 20,000,000 cu. ft. in the Dakota at 2,499 ft.

Sinclair-Wyoming 1 Anderson, SE SE SE 14-25n-89w, Sherrard dome, Carbon County, Wyoming, topped the Dakota at 2,835 ft. and found it dry. The top of the Lakota was at 2,950 ft. and on a drill-stem test showed 2,115 ft. of water in 30 minutes. The 9⅝-in. was cemented at 3,072 ft.

Texas Co. 2 Freeman, NE NW SE 20-51n-100w, Oregon Basin field, reported a completion last month and swabbing 561 bbl. in 19 hours, has been put on the pump and pumped at the rate of 14 bbl. an hour, 7 per cent water. It is an Embar-Tensleep well. Interest in the pumping test centers in its location, an outside well at the north end of the south dome and the nearest to the saddle between the two highs of any well drilled. It throws some light on the possibilities of production in the saddle.

WYOMING COMPLETIONS

Oregon Basin field, Park County: Enalpac Oil & Gas 3 McMahon, NW SE SW 32-51n-100w, T.D. 3,574 ft., 5½-in. at 3,570 ft., flowed 400 bbl. a day from the Embar-Tensleep.

Kirk Oil Co. 2 Conaghan (formerly 1 Unit 4), NW NW SE 29-51n-100w, T.D. 3,373 ft., Embar 3,344-73 ft., acidized 1,000 gal., flowed 400 bbl. a day through 40/64-in. choke on casing with back pressure of 700 lb.

Yale Oil Corp. 1 Government, NW SE NW 29-51n-100w, T.D. 3,360 ft., top Embar 3,320 ft., saturation 3,321-58 ft., swabbed 50 to 60 bbl. an hr., then acidized 1,000 gal., completed for 480 bbl. through 40/64-in. choke, C.P. 270 lb., T.P. 25 lb.

MONTANA COMPLETIONS

Cut Bank field, Glacier County: Glacier Production Co. 9 Van Ormer, SE SE NW 17-33n-5w, T.D. 2,969 ft., P.B. to 2,966 ft., 7-in. 2,930 ft., Sunburst 2,860-90 ft., show of oil at 2,875-90 ft., Cut Bank 2,926-55 ft., main pay 2,959-65 ft., swabbed 96 bbl.

NORTHWEST NEW MEXICO COMPLETIONS

Ambrosia Lakes, McKinley County: Ambrosia Investors Co., Inc., 1 Santa Fe, NE NE SW 3-14n-10w, T.D. 964 ft., in shale, completed as a water well, no oil.

Hospah field, McKinley County: Petroleum Products Corp. 28 Hospah, C NW SE 36-18n-9w, T.D. 1,733 ft., Hospah sand 1,729-33 ft., pumped 120 bbl. initial.

Permian Basin, Panhandle

(Continued from Page 58)

Wasson, Gaines County: Amon G. Carter 7 Sharp, SE NW Sec. 47, Blk. AX, P.S.L. Sur., elev. 3,532 ft., flowed 1,137 bbl. through tubing after acid, pay 4,875 ft., T.D. 4,960 ft., *southeast edge well.*

Wasson, Yoakum County: American Liberty and Atlantic 2 Morris, SE SE Sec. 732, Blk. D, Gibson Sur., elev. 3,639 ft., flowed 511 bbl. oil plus 2½ per cent water through tubing on gas lift after acid, pay 5,080 ft., T.D. 5,179 ft., *north edge well.*

West Andrews, Andrews County: Atlantic 1-A University, SE NW Sec. 12, Blk. 11, University Sur., elev. 3,298 ft., flowed 188 bbl. in 5 hr. through ¾-in. tubing after shot, Yates sand 2,560 ft., pay 4,280 ft., T.D. 4,430 ft., *½ mi. southeast of production.*

Phillips 8 University-Andrews, SE SE Sec. 14, Blk. 11, University Sur., elev. 3,316 ft., pumped 48 bbl. oil and 5 bbl. water after acid, anhydrite 1,480 ft., Yates sand 2,755 ft., pay 4,270 ft., T.D. 4,460 ft., P.B. 4,450 ft.

West Fuhrman, Andrews County: Fuhrman Petroleum 2 Thornberry, NW NW Sec. 23, Blk. A-42, P.S.L. Sur., elev. 3,221 ft., flowed 216 bbl. through ⅛-in. tubing choke on gas lift after acid, pay 4,355 ft., T.D. 4,580 ft.

TEXAS PANHANDLE COMPLETIONS

Gray County: Magnolia 51 fee-227, Sec. 10, Blk. 3, potential 79 bbl. oil and 48 bbl. water, shot 2,970-3,036 ft., T.D. 3,036 ft.

Hutchinson County: Continental 5 Sanford-C, Sec. 79, Blk. 46, potential 148 bbl. oil natural, T.D. 2,794 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Grayburg, Eddy County: Mizel & Ployhar 1 Friess, NE NW SE 19-17-31, flowed 18 bbl., top pay 2,815 ft., T.D. 3,521 ft., acid and shot.

Michigan Fields

(Continued from Page 65)

1 Wheatley-Clawson, NE NW SE 30-3n-12w, wildcat, dry, T.D. 1,555 ft.

Monterey Township: Union Oil Co. 1 Arnst, W½ SE SW 2-3n-13w, wildcat, dry, T.D. 1,684 ft.

Bay County, Kawkawlin Township: Gulf 1 Bauer, S½ NE SE 34-15n-4e, pumping 75 bbl., acidized, T.D. 2,900 ft.

Clare County, Hamilton Township: Sun 1 McClure-Wilson, C SW 9-19n-3w, wildcat, dry, T.D. 1,415 ft.

Hayes Township: Gordon Oil Co.-Union Drilling & Producing Co. 1-H State, S½ SE NE 30-19n-4w, wildcat, dry, T.D. 4,310 ft.

Redding Township: Pure Oil Co. 1 Van Deusen, SE NE 1-19n-6w, 688 bbl. natural, T.D. 3,797 ft.

Winterfield Township: Taggart Bros. Co. 111 Sischa-Blackley, C SE 17-20n-6w, dry, T.D. 1,361 ft.

Clinton County, Watertown Township: Seba Oil & Development, Inc., 1 Zischke, SW SW NW 14-5n-3w, wildcat, dry, T.D. 5,363 ft.

Missaukee County, Riverside Township: Pure 1 Bowman, N½ NW NW 14-21n-7w, location abandoned.

Gulf 1 Bronkhorst, N½ SW NE Sec. 14, wildcat, dry, T.D. 3,953 ft.

Osceola County, Lincoln Township: Taggart Bros. Co. 36 Duddles-State et al, C NW 16-18n-10w, 4,520,000 cu. ft. gas, T.D. 1,280 ft.

Taggart Bros. Co. 37 Cook-Duddles, C SW Sec. 9, 388,000 cu. ft. gas, T.D. 1,223 ft.

Richmond Township: Gulf 1 Fulmerhouser, N½ SE NE 5-17n-10w, 471 bbl. natural through ⅛-in. choke, T.D. 3,550 ft.

Roscommon County, Richfield Township: Ohio D-1 State, C N½ NW NW 28-24n-1w, flowing 43 bbl., acidized, T.D. 4,198 ft.

Sun A-1 State-Richfield, N½ SE NW Sec. 29, flowing 57 bbl., acidized, T.D. 4,197 ft.

Pure D-1 State-Roscommon, N½ SW NE Sec. 34, dry, T.D. 3,454 ft.

Tuscola County, Wisner Township: Charles W. Teater 1 Cosens, NE SE SE 26-14n-7e, dry, T.D. 1,612 ft.

Van Buren County, Bloomingdale Township: Lester Harris 1 Hayes-Munn, SW NW 10-1s-14w, dry, T.D. 1,297 ft.

NORTH LOUISIANA, ARKANSAS

New Wilcox Fields in Eastern Louisiana

SHREVEPORT, La.—Main interest in the North Louisiana district was centered on H. L. Hunt 24-F Goodpine Lumber Co., a wildcat located 14 miles northwest of the Winn field in Winn Parish. While details of this well have been withheld by the operator, three or more sands in the middle Wilcox are reported to have shown possible production on an electrical log. The well was drilled to a total depth of 8,905 ft., and 7-in. casing was cemented at 6,095 ft. Sands scheduled to be tested were reported logged at 4,100 ft., 4,900 ft., and 5,600 ft. The well is located in 13-12n-5w, and is one of the deepest tests drilled along this particular trend.

To the southeast, and located in the Ferriday area, Concordia Parish, California 1 Pan American Life Insurance Co., which recently showed for a gas-distillate producer in the Tuscaloosa sand, has been killed and recompleted as a producer in the Wilcox sand. The well was originally tested at 8,935-46 ft., and it flowed 174 bbl. of 59.5-gravity distillate daily through a $\frac{8}{64}$-in. choke. After making a series of tests the well was killed and it is now flowing at the rate of 113 bbl. per day through various chokes from perforated casing at 4,567-71 ft. In the meantime, the company's 2 Pan American, a short distance from the discovery well, is testing through perforated casing at 4,554-75 ft., and is flowing pipe-line oil along with some salt water. This new field is located in 16-9n-10e, near the east bank of the Mississippi River, and is the first production to be found in the parish.

NORTH LOUISIANA COMPLETIONS

Wildcat, Catahoula Parish: Carter Oil 1 Zenoria Lmbr. Co., SW SW 11-8-6e, dry, T.D. 5,195 ft., Sparta 2,000 ft., Cane River 2,900 ft., Wilcox 3,202 ft., no Midway.

Wildcat, Red River Parish: Charles C. Lowery 1 Lester, SW 41-12n-10w, dry, T.D. 3,515 ft.

Converse Parish: Whitehurst Drlg. 1 Paul estate, 28-9-13, dry, T.D. 3,252 ft.

Haynesville, Claiborne Parish: Ohio Oil 2 Hunt 3-P, SW NE 16-23-8w, flowed 383 bbl. in 7½ hr., Pettit 5,284-5,302 ft., 5,331-34 ft., 5,346-52 ft., T.D. 5,400 ft.

Little Creek, La Salle Parish: H. L. Hunt F-112 Goodpine, NE NW 5-8-2, dry, T.D. 4,048 ft.

Nebo, La Salle Parish: Grubb & Hawkins 1 Ward, SW NE NE 39-7n-3e, pumped 125 bbl., Wilcox 3,960-64 ft., T.D. 4,096 ft.

Sugar Creek, Claiborne Parish: Carter Oil 2 Dobbins, NW NW 12-19-6w, flowed 94 bbl. in 3 hr., Ozley sand 5,828-48 ft.

Vivian, Caddo Parish: A. P. Gilbert Bell, NE NE SE 34-22-16w, flowed 300 bbl., sand 2,415-30 ft.

ARKANSAS COMPLETIONS

New London, Union County: Marine Oil 1 Walton, NE NW 13-18-12w, perforated 5,716-28 ft. in Cotton Valley, flowed 150 bbl. through choke, T.D. 5,875 ft.

Urbana, Union County: Creslenn Oil 1 Parker-Witt, SW NW NW 2-18-13w, abandoned location.

MISSISSIPPI COMPLETIONS

Lamar County: W. S. F. Tatum 2 fee, W½ SE 13-2n-16w, dry, T.D. 7,710 ft.

Oktibbeha County: John Allen 1 Howell, SW NE SW 2-19n-13e, dry, T.D. 4,975 ft.

LEGAL

United States Department of the Interior, District Land Office, Evanston, Wyoming. Notice is hereby given that the oil and gas deposits in the NW¼ SE¼ Sec. 27, T. 27 N., R. 113 W., 6th P.M., La Barge field, Wyoming, are offered to the responsible qualified bidder of the highest bonus per acre for a lease under Section 17 of the amendatory leasing act of August 21, 1935 (49 Stat. 674) at the royalty rate scale in the lease form shown in Circular 1386 at a sale to be held in the district land office, Evanston, Wyoming, at 10:00 A.M. on July 14, 1942. The successful bidder must deposit with the Register on the date of sale a certified check on a solvent bank or cash for 1/5 of the amount bid and file the showing of qualifications to receive a lease as required by Section 7 of Circular 1386. The remaining 4/5 of the amount of the bid, together with the first year's rental of $1.00 an acre must be paid and a $5000 corporate surety bond furnished prior to issuance of the lease. All bidders are warned against violations of the provisions of Section 59 of the United States Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids at the discretion of the Secretary of the Interior. Register.

North Turner Valley

In the North Turner Valley extension, 10 wells are shut down pending decision as to further operations in what looks like a deep-drilling area. The most northerly test, Inland-Sarcee 1, LSD 2, 4-23-4w5, is drilling in lower Benton below 7,379 ft. This test is 10¾ miles north and 4½ miles west of the most northerly producer, Atlas-British Dominion 2. Three other North extension wells are still active. Major Oil 12, LSD 4, 36-21-3w5, has resumed in the upper Blairmore formation from 8,205 ft. Bonaventure Royalties 1, LSD 16, 24-21-4w5, in the lower Benton at 6,126 ft., is changing to heavy-duty rotary. North End Petroleum 3, LSD 4, 20-21-3w5, is in upper Blairmore below 7,766 ft. Dr. J. O. G. Sanderson, geologist, estimated this test will get the Madison lime around 8,350 ft.

Border Fields

Considerable activity is under way or in prospect in the border areas of Twin River, Del Bonita, Ross Lake, and Spring Coulee. Paragon Oils is working on the old Del Bonita Associated well in the Twin River area, which has been cleaned out and partially acidized. A small commercial producer is expected. The old Nordon-Roney well on the same structure has been rigged and is redrilling from about 300 ft. off bottom, and after cleaning out will acidize. It was formerly a small producer from the top of the Madison. On the Del Bonita structure, the Paragon company will drill a new well to test Madison as soon as the Twin River operations are completed. In the Spring Coulee area, Cord 1, which made a successful water shutoff in 1940, has equipment on the ground to clean out and recondition the well, and start production tests. Standard Oil of British Columbia has considerable acreage in these three areas, as well as the untested Ross Lake district, and has been carrying on extensive survey work.

(Continued on Page 73)

CANADIAN FIELDS

Rebuilt Tar Sands Plant Placed on Production

By VICTOR LAURISTON

CHATHAM, Ont.—Rebuilt mining and separation units of Abasand Oils, replacing those destroyed by fire last November, have resumed operations in the tar-sand area of northern Alberta. The initial day's run produced 236 bbl. of oil, but the plant has an actual capacity of 600 bbl. daily, and the output will gradually be stepped up. The average recovery is around 0.9 bbl. of oil to a ton of sand. Difficulties previously encountered with the mining and conveying equipment have been overcome in the new plant. In the 6 months preceding the fire, the company produced 41,000 gal. of gasoline, 71,000 gal. of diesel fuel, 137,000 gal. of other fuel oils and 320 tons of coke. Consolidated Mining & Smelting Co., which previously took the entire diesel and fuel-oil output for its northern operations, has ordered approximately six times last year's deliveries; and the U. S. Army at Waterways has requisitioned all the company's fuel in storage.

In the Ram River-Clearwater area, in the northern Alberta foothills west of Rocky Mountain House. Ram River Oils 2, LSD 8, 1-37-11w5, finished in the Devonian limestone at 4,340 ft., is starting production test, of showings encountered in a porous horizon between 4,250 and 4,325 ft. The well was shut in for 5 days after the strike, during which pressure on the casing valves was built up to 125 lb., increasing at a rate of 25 lb. a day, and it is hoped a flowing well may develop after bailing some of the drilling fluid. An expert of the Alberta Conservation Board will be present at the production tests. This is the first well in Alberta to secure good showings in the Devonian limestone.

8 Good Tips

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3. HAVE BRAKES EQUALIZED AT ALL TIMES

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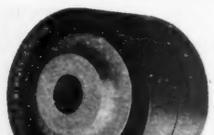

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Among the Drilling

BREWSTER-BARTLE Drilling Co., Houston, Tex., was scheduled to test Ohio Oil Co. 1 McDonald, a wildcat located midway between the North Markham and Van Vleck fields, Matagorda County, Texas. Casing was cemented at 8,494 ft., preparatory to testing three sands in the Frio formation.

A. B. COBB & Co., Cut Bank, Mont., has contracted to drill Ed Reagan's second test in a new gas area in Glacier County, Montana. The newly contracted well is ¾ mile south and west of the discovery gas producer and is the C NW NE 27-37n-7w.

HOUSTON Drilling Co., Houston, Tex., was attempting to extend production in the new Harmon field, Jackson County, Texas, as testing was under way at Gulfboard Oil Co. 1 McCory.

S. D. BUTCHER and J. LLOYD CAREY, of Wichita, Kans., who have been operating under the name of Rocket Drilling Co., have announced the dissolution of their partnership. Mr. Butcher will continue drilling and producing operations under the name of Rocket Drilling Co., and Mr. Carey will operate individually.

GRAY & WOLFE, Houston, Tex., are moving a rotary southwest of the Lake Creek field, Montgomery County, Texas, where location has been made for their 1 Grogan-Cochran Lumber Co., located in the A. Prather Survey. The well is scheduled to be drilled to a depth of 10,300 ft.

B. G. BYARS, Tyler, Tex., was given the contract for two tests in the new Club Lake area Woodbine sand pool in Hunt County, East Texas, to be drilled on the Graham tract in the Charles Hart Survey, west of the discovery well, by D. F. Hughes and L. A. Grelling. Exact locations had not been announced.

HARBAR Drilling Co. is drilling 10 Atkins for Sinclair Prairie Oil Co. in Cooke County, Texas. The contractor has another rotary assigned to the Sinclair Prairie Parthenia P. Hill lease, 3½ miles southwest of Nocona in Montague County, Texas.

LOFFLAND Brothers Co. has received the contract to drill Sinclair Prairie 4 I. M. Jones in Montague County, Texas, 1½ miles northeast of Forestburg. The same contractor is drilling 3 I. M. Jones to a contract depth of 7,300 ft.

ARROW Drilling Co., of Tulsa, has spudded in for Sinclair Prairie Oil Co. in Montague County, Texas, near Nocona, to drill a wildcat known as 1 Eanes.

MANAHAN Drilling Co., of Tulsa, is drilling 2 Henderson, a new test for Sinclair Prairie Oil Co., 176 ft. northwest of 1 Henderson, which is a junked hole in Montague County, Texas, 2½ miles northeast of the Denver townsite. The contractor has two other operations under way on Sinclair Prairie leases in Montague County. Manahan is drilling 1 J. A. Fooshee and 2 Jones, the former being 3½ miles southwest of Nocona and the latter is 1½ miles northeast of Forestburg.

W. B. OMOHUNDRO, drilling contractor of Wichita Falls, Tex., is drilling 1 Mrs. A. Richardson for Continental Oil Co., 6 miles east of Bowie in Montague County, Texas. The test is an offset to the Mueller discovery well, and is located 800 ft. to the southeast.

FAIN Drilling Co. has moved a heavy rig from Willamar field of eastern Willacy County, lower Rio Grande Valley, Texas, to southeastern Cameron County, Texas, where they will drill a deep test for Pure Oil Co. to be known as 1 Shelton Award Vacancy. The location is about 7 miles northwest of Port Isabel in Santa Isabel grant.

PARKER Drilling Co. has material on the ground for a 9,000-ft. test for Ohio Oil Co. in Freestone County, Texas. The location, known as 1 F. E. Hill, Jr., is in the T. Dubronner Survey, 5 miles north of Butler.

FITZPATRICK Drilling Co. was scheduled to test Tide Water Associated 1 Gips, a prospective Wilcox sand pool opener located 11 miles southwest of the town of Yorktown, De Witt County, Texas. Total depth of the well is 8,500 ft., and 5½-in. casing was cemented at 8,400 ft. Three sands at 7,000, 8,200 ft., and 8,300 ft. were expected to be tested.

OHIO Oil Co. was scheduled to let contracts for two wells to be drilled in the Texas Gulf Coast district. In Matagorda County location was made for 1 McDonnald Account 2, an offset to the company's 1 McDonnald, a prospective pool opener, while in Austin County bids were expected to be received for 1 First National Bank of Galveston, a projected 10,000-ft. Wilcox test located 3 miles southeast of Orangehill.

ROWE & McBRIDE are moving a rotary to Jim Wells County, Texas, where location for a 5,500-ft. wildcat is to be drilled on the Z. H. Corbett lease, 1½ miles northeast of Sandia.

ALLEN & MORRIS, San Antonio, Tex., received contract from Seaboard Oil Co. for 3 Burrows, located in the Odem field, San Patricio County, Texas.

L. T. BARBER has the contract for Belvidere Oil Co. 1 Peacock, SW SW SW 22-13n-5w, Isabella County, Michigan. The company also has the contract for Belvidere Oil Co. 1 Chipman (Community), NE NW

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Franks skid rigs — 5 models for medium depth standard and deep "slim-hole" drilling to 8,500 ft. —are complete with every essential an integral part of each unit including: drawworks; power plant; derrick; raising device; rotary table; pumps; swivel; kelly; crown block. All parts balanced for true operating economy and fastest rig-up, teardown and moving.

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WELL SERVICING AND DRILLING UNITS
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TULSA, OKLAHOMA

Contractors

SE of 17-7n-13w, in Montcalm County, Michigan.

W. G. RAY Drilling Co., Shreveport, La., has been awarded contract by Gulf Refining Co. to drill an 8,500-ft. hole in the northern part of 8-2n-4e, 3 miles east of Braxton, Miss. The well is to be located on a part of a 107,000-acre 10-year lease which was acquired by Gulf in 1933 from Simpson Realty Co., and production on any part will hold all of it. The area extends into George, Greene, Stone and other counties and actual activity on the test is expected to get under way immediately.

W. C. BRISCOE Drilling Co., Kilgore, Tex., was moving in on Coastal Refineries, Inc. 1 Tier, Houston County, Texas, for a Wilcox test.

PRINCE BROTHERS have contract for Falcon Co. 1 Keitt, a new Smackover lime wildcat in Navarro County, Texas, in the Benton Survey, 10 miles west of Currie. Site is northeast of a Texas Co. failure in Limestone County, along the Smackover shoreline play.

RHODES Drilling Co., Abilene, Tex., will drill four wells, three for Anderson-Prichard and one for H. T. Owens et al, in the new Coker pool of Coleman County, Texas.

RICHMOND Drilling Co., Midland, Tex., is drilling below 4,490 ft. in hard lime on its wildcat about midway between the Vacuum and Mal jamar pools in western Lea County, New Mexico. The well is in C NE SE of 10-17s-33e.

GARETSON & KNISELY, of Douglas, Wyo., are the rotary constructors for a new test to be drilled on Rattlesnake Butte, Petroleum County, Mont., southeast of the town of Winnett. The contractors are moving in rig. The present hole, known as the Watson Oil Co. 1 Austed, is to be abandoned. It is 1,600 ft. deep.

ASHBY Drilling Co. will use a rotary rig to drill Ohio Oil Co. 1 Fairbanks, in Lake County, Michigan, in C S½ SW NE 11-20n-14w, in Elk Township, through the Marshall. Company tools will be used for the cable-tool finish.

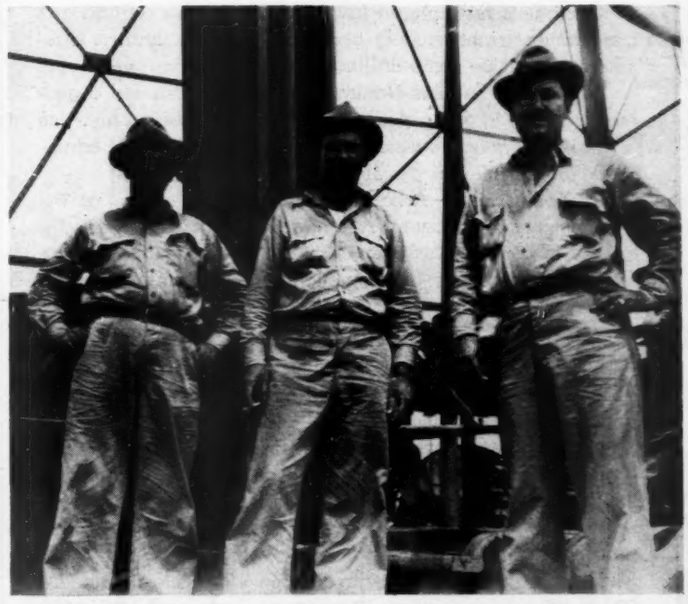
MERCURY Drilling Co. and Anderson-Pritchard Oil Corp. have set surface pipe and are waiting on casing on their new start for McPherson County, Kansas. Location is in the NW SW SE of 15-18s-1w.

RUSO Drilling Co., Tulsa, was drilling below 1,800 ft. on its 1 Puetz, in CSL E½ NE of 1-28s-4w, in Sedgwick County, Kansas.

SMITH BROTHERS Drilling Co. has started work on the new 1 Porterfield, in C SE NE of 6-9n-3e, the Sharp area of the old Centerpoint field, in Pottawatomie County, Oklahoma.

C. ANDRADE, of Dallas, Tex., has started work at the 1 Schenck, in Hunt County, Texas, southeast of the Mary Latham Survey, 2½ miles southwest of the Hollandsworth Drilling Co. 1 Baker, discovery well in Club Lake pool, 4 miles south of Dixon. Contract is for 5,000 ft. on a 500-acre lease spread.

HOLLANDSWORTH Drilling Co. and six associates, drillers of the discovery well in the Club Lake area of Hunt County, Texas, are reported planning two new tests, their 2 Baker, 990 ft. north of the discovery, in the L. Handlin Survey, and the 3 Baker, 990 ft. southeast in the same survey as the discovery.



R. E. Featherstone, general superintendent of Titanic Oil Co.; Sam Pyland, tool pusher of the company, and George Echols, president of the company, and owner of Echols Drilling Co.

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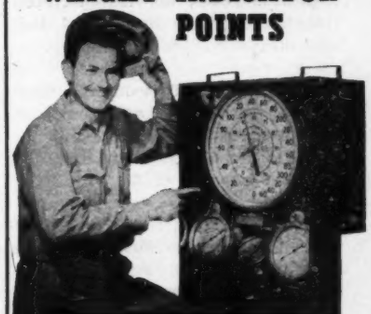

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A. P. McQUISTON, BAKERSFIELD, CALIFORNIA
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Personal Paragraphs

W. W. ROBINSON, Texas Co., and new president of the California Natural Gasoline Association, did not lose any time getting down to work and has tentative papers lined up for almost a year ahead subject to last-minute changes in titles and authors.

GEORGE B. PATTERSON, Socony-Vacuum Oil Co., Inc., engineer specializing in aviation lubricants and hydraulic fluids, has been commissioned a major in the United States Army and has been assigned to active duty with the Air Corps, material division, at Wright Field, Dayton, Ohio. Major Patterson won his wings and a commission in 1917, and was one of the Army's first 200 pilots.

C. R. RIDER, vice president of Drilling & Exploration Co., is in Mexico City, Mexico, on a short trip.

W. E. BOYD, civil engineer for Humble Oil & Refining Co., in the Hawkins, Texas, district, has been transferred to the East Texas division offices.

A. L. BEASLEY, scout for Shell Oil Co., Inc., with headquarters at Lake Charles, La., left last week for San Antonio, Tex., where he will be inducted into the U. S. Army.

FLOYD BRETT, formerly district superintendent for Sinclair Prairie Oil Co. at Troup, Tex., has been transferred to Fort Worth, Tex., as assistant to the division superintendent of production.

J. F. BLACKWELL, production engineer, Texas Co., Tulsa, has been ordered to report to Fort Sill, Okla., on July 7. Mr. Blackwell is going on active duty as he holds a commission as first lieutenant in the artillery.

JOSEPH S. BLACKMAN, deputy conservation officer in Tulsa for the Oklahoma Corporation Commission, has been named for a commission in the Army Air Corps and has gone to Miami Beach, Fla., to attend officers training school.

GEORGE V. COHEE has resigned his post as assistant geologist in the Oil and Gas Division of the Illinois Geological Survey, and has become assistant state geologist in charge of the Indianapolis office of the Indiana Geological Survey.

E. W. LOUNSBURY, secretary and director of David Reid Co., Inc., tank, steamer, and oil brokers, has been commissioned a captain in the Army. He is in the Army Transport Service, effective June 26.

P. J. WILLIAMS has been transferred to the Austin, Tex., division as division superintendent, to replace W. B. SANDERS, who has been transferred to the Missouri division in the same capacity for Shell Pipe Line Corp., Houston, Tex.

RICHARD H. WILLS

RICHARD H. WILLS, who has been an active member of Mid-Continent Petroleum Corp.'s legal staff for 20 years in the capacity of assistant to the late J. C. Denton, has been elevated to the office of vice president and general counsel. Mr. Denton was his predecessor as head of the legal department. Mr. Wills is a native Tennesseean, and was educated at George Peabody College and Vanderbilt University. He came to Oklahoma in 1910, entering private practice in Claremore. Mr. Wills is married and has twin daughters and a son, the latter in the provost marshal's department of the U. S. Army.

DAN O'CONNELL, of Texas Co., at Houston, Tex., has been named assistant to the management at New York City to handle national transportation matters for the company. He has already assumed his new post. He formerly handled transportation matters for the company in the 11-state southern district.

Do You Remember?

From The Oil and Gas Journal Files

40 YEARS AGO

The Plant line steamer "Florida" is being converted into a tanker at Philadelphia, and will go into service for Texas Oil & Transit Co., plying between Sabine Pass and Atlantic points. She will have a capacity of 17,000 bbl.

The Export Oil & Pipe Line Co. announces the completion of its pipe line to Port Neches. The company has a contract to supply 7,500 bbl. of crude per day to Asphalt & Refining Co.

Several air compressor and pumping plants are in course of construction at Spindletop. One will have power to operate 40 wells.

25 YEARS AGO

Geologists have made favorable reports on oil and gas possibilities in the vicinity of Roundup, Mont., and as a result there will be some drilling thereabouts.

Officials of Peoples Natural Gas Co. have issued a general warning to gas consumers of a shortage of supply. Use of coal heaters is suggested to provide the comforts of households during coming winters.

In Yell County, Arkansas, farmers are excited at the prospect of an oil boom. Among other serious matters discussed in connection therewith is the possibility that oil operations may cause an extinction of coon hunting in that vicinity.

15 YEARS AGO

Efforts are being made to have President Hoover present and as a speaker at the annual banquet of the Mid-Continent Oil and Gas Association at Tulsa, which will be held during the International Petroleum Exposition.

Fifty thousand tons of pipe will be used in constructing the 20-in. natural-gas pipe line being built to transport Amarillo gas to Kansas and Missouri. The estimated cost of this pipe is $4,000,000.

Japan's importation of gasoline in 1926 is estimated at 29,192,000 gal., more than 10 times as much as the 2,758,000 gal. imported in 1918.

FRANK E. OWENS, district petroleum engineer in the Luling, Texas, district, for Humble Oil & Refining Co., has been transferred to the Stratton, Texas, district.

L. H. SPINER, who left Shell Oil Co., Inc., to become head of marketing for OPC District 1, has resigned to enter the Army. He has been succeeded by C. A. LOCKHART.

JAMES C. POSGATE, district petroleum engineer in the Stratton, Texas, district, for Humble Oil & Refining Co., has been transferred to the Southwest Texas division at Corpus Christi, Tex.

ANDREW W. MacMURTRIE has been named to take the place of WILLIAM D. MASON as plant manager of Sun Oil Co.'s Marcus Hook refinery, while Mr. Mason is in Washington as director of the Facility Security Division of OPC. Mr. MacMurtrie has been with the refinery for 32 years.

C. I. HOLLIMAN, assistant district superintendent for Texas Co., at Salem, Ill., has been ordered to report for duty in the Army on July 1. Mr. Holliman has a commission as first lieutenant. AL KRAFT, former district superintendent at Drumright, Okla., will take Mr. Holliman's duties as assistant to W. C. KNEALE, superintendent at Dallas.

ALBERT H. PIERCE, foreman at Seminole, Okla., for Mid-Continent Petroleum Corp., has been named superintendent of the southern division of the company, succeeding the late GEORGE W. SHOWALTER. MELVIN RIGDON, foreman of the Oklahoma City, Okla., district, was named assistant to Mr. Pierce, and ROY E. WINGO, roustabout at Seminole, will be transferred to Oklahoma City as foreman.

ANDREW J. SCHOEPPEL, who recently resigned as chairman of the Kansas Corporation Commission, plans to tour Central Kansas in his efforts to land the Republican governor's nomination.

EARL W. WEBB, president of the Ethyl Corp., and chairman for the petroleum section of the Greater New York Fund, reported at a luncheon meeting held in New York recently that the petroleum group has voted a quota of $40,000 as its goal for this year's drive.

HOWARD S. BRYANT, division geologist for Skelly Oil Co., has resigned to become head of the geological and exploratory department of Hollow Drilling Co., Wichita, Kans. Mr. Bryant has been with Skelly since 1928. He will be succeeded by WILLIAM W. KEELER, who has been district geologist at Evansville, Ind. GEORGE R. WESLEY, assistant at Evansville, succeeds Mr. Keeler there.

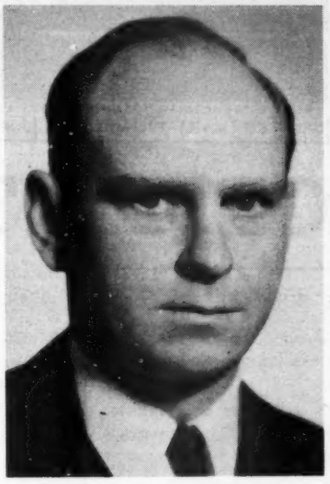
D. W. HOVEY, vice president and general manager of Republic Oil Refining Co., has been reelected president of the Gulf Coast Refiners Association. Other officers elected were: GEORGE IRVINE, American Republics Corp., first vice president; JOHN A. BARTLETT, Amsco Pipe Line Co., Corpus Christi, Tex., second vice president; L. F. ROTHERMEL, Maritime Oil Co., reelected treasurer, and GEORGE REID, reelected executive secretary.

To wind up the rubber collection a committee consisting of LLOYD WILLIAMSON, A. C. RUBEL, W. C. WHALEY, W. W. ROBINSON, D. B. O'NEILL, RUSH BLODGETT, D. S. KILGOUR, R. E. FENTON, DANA HOGAN, L. A. CRANSON, FLOYD BRYANT, GROVER KELLEY, GEORGE SUMAN, RALPH B. LLOYD, MARTIN MEERS, GEORGE TREMBLEY, L. L. AUBERT, W. H. MORGAN, H. F. OWENS, E. E. PYLE, F. E. JOHNSON, and J. A. SMITH was appointed and instructed to make a determined drive to get every scrap of rubber available in California.

Shifts: D. E. BEAVER, superintendent, Shell Pipe Line Corp., Kilgore to Alba, Tex.; A. J. HOLLAND, superintendent, Texas Co., Midland, Tex., to Salem, Ill.; N. H. JAMES, engineer, Stanolind Oil & Gas Co., Refugio, Tex., to Tulsa; ROY CHATBURN, engineer, Texas-Empire Pipe Line Co., Pana to Wilmington, Ill.; LEO I. MULLANEY, engineer, Texas-Empire Pipe Line Co., Coal City, Ill., to Chanute, Kans.; G. P. ROSE, engineer, Texas-Empire Pipe Line Co., Fairbury, Ill., to Scammon, Kans.; THOMAS E. SULLIVAN, engineer, Shell Oil Co., Inc., St. Louis, Mo., to New York City; HAROLD R. SELLS, engineer, Kerlyn Oil Co., Oklahoma City, Okla., to Sunray, Tex.; JAMES M. PHILLIPS, engineer, Stanolind Oil & Gas Co., Ocean Springs, Miss., to Tuscaloosa, Ala.; C. J. GREEN, superintendent, Shell Oil Co., Inc., Wichita Falls, to Archer City, Tex.; H. C. TALLEY, engineer, Texas Co., Houston to Odessa, Tex.; K. V. BENSON, engineer, Texas Co., Houston, Tex., to Harrisburg, Ill.; F. R. SMITH, superintendent, Gulf Oil Corp., Indianapolis, Ind., to Tulsa; CHARLES K. CLARK, geologist, Pure Oil Co., Goshen, Ind., to Saginaw, Mich.; JOHN A. WOODSIDE, engineer, Cities Service Oil Co., Ponca City, Okla., to Pittsburg, Kans.; WILLIAM H. GIBSON, geologist, Texas Co., Calgary, Alta., Canada, to Houston, Tex.; FRANK H. MUELLER, Mueller Co., Defiance, Ohio, to Decatur, Ill.; W. C. ANDERSON, engineer, Texas Co., Bellaire, Tex., to Douglaston, N. Y.; A. E. BERNDES, JR., engineer, Texas Co., Clarksville, Tex., to Oberlin, La.; S. S. GIEZENDANNER, engineer, Texas Co., Clarksville, Tex., to Oberlin, La.; W. O. RAMSEY, engineer, Atlantic Refining Co., Longview, Tex., to Omaha, Neb.; H. R. SNOW, engineer, Standard Oil Co. of Indiana, Neodesha, Kans., to New York City; C. J. KNUTSON, engineer, Plantation Pipe Line Co., Meridian, Miss., to Marshall, Tex.; H. N. K. BROOKINGS, geologist, Phillips Petroleum Co., Oklahoma City, Okla., to Alexandria, Va.; HUBERT C. BAUMLER, engineer, Cities Service Oil Co., Barnsdall, Okla., to Potosi, Wis.; ARNOLD LANSDALE, superintendent, Phillips Petroleum Co., Beaumont, Tex., to Plaquemine, La.; W. F. SHELTON, superintendent, Phillips Petroleum Co., Golden, Colo., to Great Bend, Kans.; R. O. STORY, engineer, Humble Pipe Line Co., Denver City to Odessa, Tex.; EVERETT S. WENGER, engineer, Stanolind Oil & Gas Co., Tulsa, to Houston, Tex.

Up From Ranks

The recent election of R. L. Bosworth to be treasurer of Continental Oil Co. provides another of those "up from the ranks" stories that Horatio Alger could sink his teeth into.



R. L. BOSWORTH

Mr. Bosworth succeeds, as treasurer, George F. Smith, who relinquished duties of the office to give his full time as vice president to the heavier burdens which have been placed on him by the changes to wartime policies being made by Continental.

Bob Bosworth started as a bookkeeper with the Continental organization in 1923. He was successively advanced to be accountant and office manager, was named chief accountant in April 1929, and became assistant treasurer in July 1930. As assistant secretary and assistant treasurer he moved to Continental's New York office in January 1933.

Bob is, incidentally, one of the youngest treasurers of a major oil company in the United States. Born in Oklahoma City in 1900, he attended Oklahoma University and was graduated from the University of Wisconsin. After having been employed for a few months by an oil company in Oklahoma City, he left that job to join the Continental organization.

Mr. Bosworth will be succeeded as manager of the New York office by Serge B. Jurenev, who comes to Continental from the U. S. Department of Justice, where he served as head of the research division.

G. DUNCAN JOHNSON, exploration geologist for Shell Oil Co., Inc., Centralia, Ill., is now cartographic engineer for the U. S. Navy Department in Washington, D. C.

HARRY HORERNADEL, chemist for Cities Service Oil Co. at Bartlesville, Okla., addressed the Rotary Club at Pawhuska, Okla., last week, his address having to do with what can be expected in the way of synthetic materials after the war.

DAVE JENKE, scout for the Magnolia Petroleum Co. in the Laredo, Texas, district, has been transferred to the company's offices at Houston, Tex., as scout in the Texas Gulf Coast district. He replaces JACK WISE, who is leaving for Army duty.

H. T. EARL, assistant vice president of Tide Water Associated Oil Co., and in charge of the company's transportation department in California, is recuperating from a pneumonia attack and expects to be back at his desk within another few weeks.

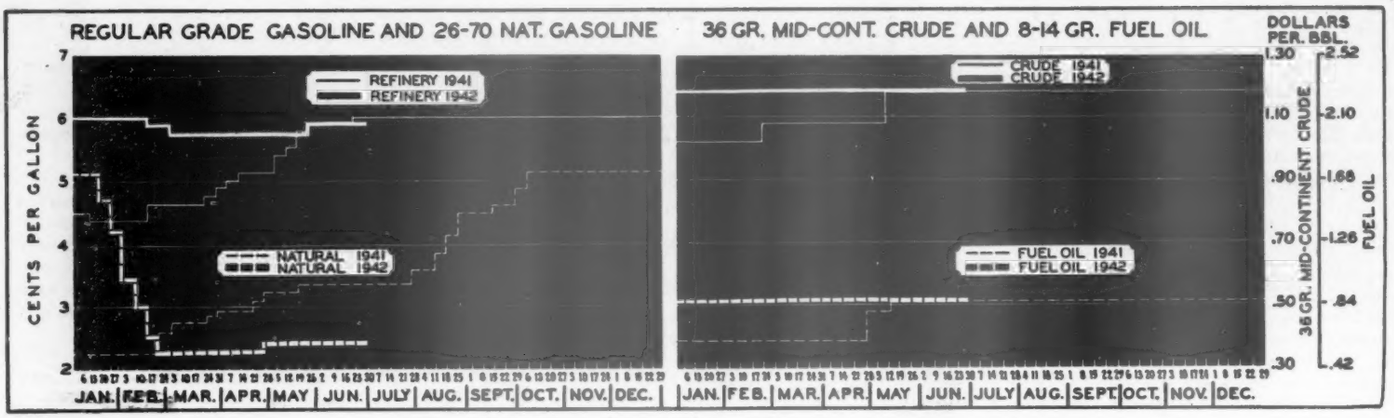
G. R. HENSON, Shreveport, La., has joined Sunray Oil Co. as manager of the Kansas division land department. Mr. Henson was formerly associated with A. G. Oliphant Oil Corp. at Shreveport, where he was in charge of drilling and producing operations. Prior to that he was for 14 years with Shell Oil Co., Inc.

A. K. DRISKILL, of Iraq Petroleum Co. at a recent meeting of the Los Angeles (Calif.) Nomads Club, told of his adventures in Iraq during the short time the Germans were in control. BILL HIGGINS, formerly with Papua Oil Development Co., described the conditions on the island of New Guinea and pointed out the importance of air transportation in the development of the interior of the island. CARL JAUMAN, formerly with Antilles Petroleum Co. in Trinidad, gave some interesting facts on the new Army-Navy air base being built in Trinidad.

JOE DRANGUET, Texas oil executive, has joined Lucey Petroleum Co., Dallas, Tex., as the firm's executive vice president. He has disposed of his interests in Talco Asphalt & Refining Co., to which he has been devoting the major portion of this time. Mr. Dranguet first became associated with the oil industry in 1927, with Root Petroleum Co., El Dorado, Ark., remaining with that organization until 1937, when he became secretary-treasurer of Talco at the time of its organization.

J. M. McELWAIN, of Caminol Co. of California, has been elected executive vice president, and P. H. GREER has been elected vice president.

H. C. THAXTON was recently elected president of the South Texas Humble 20-Year Club, of the Humble Oil & Refining Co., Houston, Tex. He succeeds W. A. HUGG.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK.—The rise of 2.5 cents per gallon on gasoline prices and 2 cents on No. 1 to 4 fuel oil, inclusive, authorized Monday in the East Coast district removed part of the pessimism that has prevailed in marketing circles here for the past 5 months. Piercement of the petroleum-price ceiling was granted reluctantly by the Office of Price Administration after distributors and refiners had presented irrefutable evidence that higher transportation costs had forced all eastern operations into the loss column.

Full results of rationing were being felt by motorists this week. The shortage of motor fuel spread from the New York metropolitan area to suburban districts. About 90 per cent of the New York service stations had exhausted their supplies of motor fuel last Saturday and were unable to obtain additional deliveries until Wednesday. Local shortages were reported from Middle Atlantic and New England sections.

A serious drain on the distributing facilities of the eastern marketers was made at the start of this week. All companies attempted to replenish depleted supplies of retail outlets during the first few days of this month in order to permit a moderate amount of recreational driving over the July 4 holiday.

The East Coast tank-car subcommittee met here this week to discuss means of increasing tank-car deliveries of fuel oil, crude oil and gasoline into this district from the Midwest and Southwest, and it was concluded that a gain of some 20 per cent in the movement could be effected within a relatively short period. This would mean a gain of about 140,000 bbl. in daily average shipments over the 700,000 bbl. daily now being moved by tank car.

Mid-Continent

BUYERS continued their search of the Mid-Continent refinery market this week, attempting to increase procurements of practically all products for northern and eastern shipments. Refiners were reticent to accept new business. Several were active on the buying end of the spot market attempting to augment their current production in order to fulfill commitments with contract customers.

Interest continues to be concentrated on various grades of fuel oil, reflecting the insatiable demand from eastern and northern industrial consumers and from the railroads. Many of the inquiries are for delayed shipping but refiners are unwilling to quote more than a few days ahead because of the uncertainties surrounding the price picture.

Advances of 2.5 cents per gallon on gasoline and 2 cents on Nos. 1 to 4 fuel oil, inclusive, authorized last week and effective June 29 in the East Coast shortage area strengthened position of the interior refinery market. The advances, designed to absorb higher transportation costs incurred by moving a bulk of East Coast supplies via railroads, fortified the relation between eastern jobbers and inland refineries. The excessive costs attached to rail shipments was a strong deterrent to interior trading by independent jobbers on the East Coast which now may be modified with the added freight charges passed on to consumers.

Demand for tractor fuels is intense but has not reached its maximum level. Some areas of the agricultural belt are still too wet to permit equipment in the fields. Refiners, however, realize that considerable potential business is awaiting fruition in the rural districts of the Middle West and anticipate that shipping instructions will tax facilities even more during the next 90 days, carrying through the harvest season.

SENTENCE SUMMARIES

MID-CONTINENT: Demand for all products brisk, exceeding capacity of transportation facilities. Prices steady.

EAST COAST: Refiners, jobbers and retailers advance prices as permitted by OPA. Permanent ration fixed at 4 gal. per week.

GULF COAST: Few cargoes moving on lend-lease contracts. Domestic volume restricted to local demand and overland shipments.

PENNSYLVANIA: Bright-stock lubricating oils feature firm market for all products.

PACIFIC COAST: Trading dull in motor fuels. Burning oils of all grades in firm demand at ceiling prices.

A.P.I. REFINERY REPORT

Week Ended June 20, 1942

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks: Gasoline	Residual	Gas oil
Appalachian	160	2,915	561	489
Ind., Ill., Ky.	704	17,159	3,209	3,238
Okla., Kans., Mo.	350	8,306	1,607	1,203
Censored area*	1,493	42,018	17,182	15,165
Rockies	95	2,476	544	333
California	632	16,973	55,375	11,776
Total June 20, 1942	3,434	89,847	78,478	32,204
Total June 13, 1942	3,478	91,994	78,759	31,276
Total June 21, 1941	3,870	90,874	91,730	37,758

Note: Refinery runs and stocks for week ended June 27, 1942, appear on Trends page.

*Reports combined on East Coast, Gulf Coast, Louisiana-Arkansas and Inland Texas at request of OPC.

CRUDE-OIL STOCKS

(Bureau of Mines estimate)

Week ended:	Bbl. of crude*
June 20, 1942	252,748,000
June 13, 1942	253,386,000
June 21, 1941	259,142,000

*Excludes heavy, unrefinable stocks in California.

Gulf Coast

HOUSTON, Tex.—The Gulf Coast refinery market was unchanged this week. Activity continues to be governed by the ability to obtain transportation facilities and while tank cars and barges are becoming increasingly hard to obtain, there has been no notable decrease in movement from previous recent weeks. The storage situation has been improved to some extent by movement of several cargoes of Lend-Lease material, but the situation is still acute and several of the smaller refineries have been forced to shut down temporarily until stocks are lowered.

The Gulf Coast Refiners Association in its report of operations and inventory for the first 2 weeks of June showed some improvement in the storage situation. Crude runs for the 14 companies comprising the group, totaled 1,261,927 bbl which was at the rate of 84,128 bbl. a day, or 49.5 per cent of the total rated capacity of 170,000 bbl. Total stocks of all finished products reported at 6,288,265 bbl., showed a decrease of 569,893 bbl. from the previous report. Total gasoline stocks were 3,255,554 bbl., a decrease of 367,267 bbl. Of the current inventory 489,186 bbl. was aviation gasoline, 2,305,571 bbl. motor fuel, 125,475 bbl. high-octane blending naphtha, and 335,322 bbl. naphtha of other grades. Total stocks of all other types of gas oils were 1,174,700 bbl., a decrease of 361,037 bbl.

Pacific Coast

LOS ANGELES, Calif. — Demand for fuel oil continues to feature Pacific Coast refinery-products markets. Withdrawals from storage are continuing and quotations are holding at ceilings authorized by the Office of Price Administration.

There were no outstanding changes in the general market this week. Trading in fuel oils followed routine lines with most of the higher demand, from a long-range aspect, originating with industrial consumers and for marine operations.

Tone of the market for diesel fuels and gas oils is slightly softer but there have been no changes in general quotations. Occasional sales at concession figures were reported but they represented a minor fraction of the total volume.

Demand is steady and quotations firm on natural gasoline. Manufacturers are quoting and receiving OPA ceiling prices for practically all material traded in the open market.

REFINERY AND TANK-WAGON PRICES

(Prices as of June 27)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*	.....	.....	.....	5.625-5.750	.....	5.250-5.375	4.875-5.000
Pennsylvania	.....	.....	6.750-7.000	.....	.....	.....	.....
Gulf Coast‡	6.00-6.50	.....	.....	§5.750-6.250	§5.750-6.250	§5.250-5.750	§5.000-5.500
Northeast Coast	12.200	.....	.....	11.700	11.700	.....	.....
Pacific Coast	.....	6.500-6.750	6.125-6.250	6.250-6.500	5.750-6.250	5.25-5.50	4750-5.000

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(350-375)
Oklahoma (Group 3)	2.375	2.750-2.875	.....
North Texas	2.000	2.375-2.500	.....
North Louisiana	2.125	2.500-2.625	.....
California	.....	.....	5.000-5.500

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*	.....	.....	4.500-4.750	4.375-4.625	.....
North Louisiana	.....	.....	.....	4.500-4.750	.....
Pennsylvania	6.250	6.125-6.250	.....	.....	.....
California	.....	.....	.....	4.500-6.000	4.500
Northeast Coast	.....	.....	.....	7.700	.....
Gulf Coast	.....	.....	.....	3.875	.....

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125	.....	.....	.....	.....	.....
California	.....	2.750-4.000	.....	.....	‡$1.35-1.45	$0.85-0.90
Gulf Coast	.....	.....	4.000	4.125	1.45	0.85
Northeast Coast	.....	.....	.....	7.800	2.222	1.80
North Louisiana	.....	.....	.....	.....	.....	†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.500-3.625	3.375-3.500	$0.85	$0.85
Pennsylvania (West)	5.625-5.875	5.375-5.875	†5.250-5.500	.....
Northeast Coast	7.8	7.8	1.85	1.80
Pacific Coast	5.5	5.5	‡0.80-95	$0.80
Gulf Coast	3.875-4.0	.....	1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300. §Pacific Specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.00
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.350-4.550
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250

Neutral Oil

CALIFORNIA		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		38.50
10 pour point		37.50
15 pour point		36.50
25 pour point		31.00
200 vis., at 70° F., 3 color:		
Zero pour point		40.50
10 pour point		39.50
15 pour point		38.50
25 pour point		33.00
NEW YORK—		
Wax in bags fully refined:		
130-132 (A.m.p.) wax		6.250
133-135 (A.m.p.) wax		6.550
Crude scale:		
124-126 (A.m.p.) w.s.		4.350-4.455
124-126 (A.m.p.) y.s.		4.350-4.455

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.500	6.250-6.500	5.875	5.625
Pacific Coast	.....	6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene	Diesel fuel				Bunker
	41-43	24 G.	48-52 D.I.	58 D.I.	Bunkers	C grade
Gulf Coast	4.000-4.250	.....	4.125-4.375	4.375	$1.65-80	$0.85-95
Pacific Coast	4.750-5.000	1.25-30	.....	....	†1.35-45	*0.80-90

*Pacific Specification 400. †Pacific Specification 200.

Lubricating Oils

	Neutral oils		Bright and cylinder stocks		
	200-3	150-3	200-3	150-3	600&630 S.R.
Mid-Continent	16.8	....	28.8	24.8	.....
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Baltimore, Md.	17.55	5.50	9.10
Boston, Mass.	17.00	4.50	8.40
Burlington, Vt.	19.00	5.50	....
Buffalo, N. Y.	18.30	5.50	9.20
Dover, Del.	18.80	5.50	10.80
Hartford Conn.	17.70	4.50	....
Manchester, N. H.	19.40	5.50	9.40
Newark, N. J.	16.80	4.50	8.30
New York, N. Y.	18.20	5.50	8.40
Philadelphia, Pa.	18.30	5.50	10.55
Pittsburgh, Pa.	18.80	5.50	10.90
Portland, Me.	18.40	5.50	8.50
Providence, R. I.	17.10	4.50	8.20
Washington, D. C.	16.80	3.50	9.60
Average 14 cities	18.01	5.07	9.28

(All prices undivided dealer basis.)

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Chicago, Ill.	14.10	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	11.90	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.03	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky, and Louisiana)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Atlanta, Ga.	21.50	7.50	9.40
Birmingham, Ala.	23.10	8.50	9.00
Charleston, S. C.	21.05	7.50	....
Charleston, W. Va.	21.35	6.50	11.90
Charlotte, N. C.	22.20	7.50	9.90
Jacksonville, Fla.	21.50	8.50	8.40
Jackson, Miss.	18.00	7.50	8.50
Louisville, Ky.	17.00	6.50	8.50
Memphis, Tenn.	17.75	8.50	10.50
New Orleans, La.	17.25	8.50	*10.00
Norfolk, Va.	19.45	6.50	10.60
Average 11 cities	19.92	7.58	9.67

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	17.42	5.96	10.30
Average last week	16.53	5.96	10.30

Canadian Fields

(Continued from Page 65)

which will likely result in drilling in the Ross Lake section.

Onondaga Deep Test

An important deep test is being drilled in Onondaga Township, Brant County, by J. M. H. Young et al of Toronto, in Lot 4, Concession 2. The test is now below 2,600 ft. and will probably be carried through the Trenton limestone to the granite. In this area numerous shallow wells have secured a fair gas production.

Dutton Shallow Field

Reconditioning operations in the Dutton shallow field, in Dunwich Township, Elgin County, southwest of St. Thomas, indicate there is considerable crude still in the shallow sands. Operations are being undertaken by Empire Natural Gas Co. of Toronto which has let contracts for reconditioning a group of 59 wells. Production was originally secured around 400 ft., but work will include the deepening of at least one well to test the Guelph-Niagara and Clinton formations, in which gas production is secured farther east. Experimental work on well 52 showed that after bailing 1½ bbl. of accumulated oil the well started to flow, blowing an estimated 16 bbl. of crude in about 10 minutes, and later blowing oil and water for 25 minutes before stopping.

Crude-Oil Prices

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Smackover, Arkansas, heavy	.83
Illinois basin	1.37
Pecos County, Texas	.95
Lance Creek, Wyoming	1.12
Bradford, Pennsylvania	3.00

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

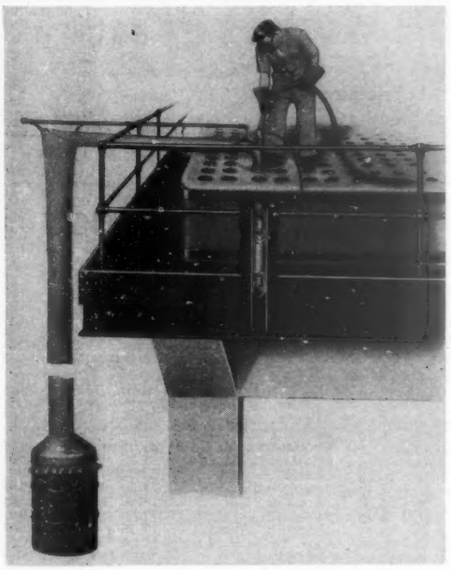
Gravity	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast, Texas	West Texas*
18-18.9	$0.80			
19-19.9	.84		$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	....	1.07	1.30	.94
32-32.9	....	1.09	1.32	.96
33-33.9	....	1.11	1.34	.98
34-34.9	....	1.13	1.36	1.00
35-35.9	....	1.15	1.38	1.02
36-36.9	....	1.17	1.40	1.04
37-37.9	....	1.19	1.42	1.06
38-38.9	....	1.21	1.44	1.08
39-39.9	....	1.23	1.46	1.10
40 and above	1.25	1.48	1.12	

*Includes Lea County, New Mexico.

EQUIPMENT PROGRESS...

Cleaners for Catalyst Reactors And Converters

A new idea in the cleaning of tubular-type catalyst reactors and converters is introduced by Elliott Co., Jeannette, Pa. The tube cleaner is operated from the



top of the unit. Exhaust air from the cleaner motor carries the removed catalyst material up the tube, around the deflector elbow, and into a container or directly into a truck at the base of the unit. The air that comes through the tubing is clean and no dust is generated. A pneumatic dust seal at the deflector elbow prevents exhaust air and dust from escaping around the hose. The cleaner motor drives a fishtail bit. The cleaner is fed through the tube with an operating hose. Equipment includes a tube-cleaner motor of the Elliott 1100 series double ball-thrust type.

Research on Nickel At Mellon Institute

International Nickel Co., Inc., New York, has resumed investigational work at Mellon Institute of Industrial Research, Pittsburgh, Pa., by the establishment of an industrial fellowship that begins operation on July 1. This fellowship is concerned with a comprehensive program of scientific research on certain problems in the chemistry and technology of nickel, embracing particular attention to the preparation, properties, and uses of nickel compounds, especially organic derivatives.

Dr. John Gilbert Dean, a physico-organic chemist, is the incumbent of this fellowship. He received his professional education at Brown University (Ph. B., 1931; M.S., 1932) and Columbia University (Ph.D., 1936) and has subsequently had 5 years of experience in applied chemical research.

TRADE LITERATURE

OIL WELL SUPPLY CO., Dallas, Tex.—Seven bulletins: B1-342, on the No. 250 crown block; B-342, on the No. 350 crown block; B3-542, on the No. 110 crown block; B-4-542, on the 80-in. streamline traveling block; B5-542, on the 66-in. streamline traveling block; B6-542, on the 60-in. streamline traveling block, and B7-542, on the 15-in. 200 crown block. The bulletins are all illustrated with both photographic and assembly picturization.

FOXBORO CO., Foxboro, Mass.—Bulletin A-264, on instruments for the automatic measurement and recording of densities of porcess liquids. In place of periodic readings by hydrometer and still samples, the Foxboro density recorder records the continuous direct measurement of the flowing liquid. Auxiliary equipment for the installation is shown in the bulletin.

BRISTOL CO., Waterbury, Conn.—Bulletin No. T302, on the company's line of fully compensated liquid-level recording thermometers for temperatures between —125° and +400° F. The bulletin gives detailed information concerning construction of the instrument, the various forms in which it is furnished, and also informaiton concerning its application.

UNITED STATES STONEWARE CO., Akron, Ohio.—Bulletin 702, which describes the company's new and improved Series 697 centrifugal acid pumps, which are chemical stoneware lined. The bulletin is illustrated with photographs, drawings, and charts showing characteristic performance curves.

New Type Variable-Pitch Cooling Fan

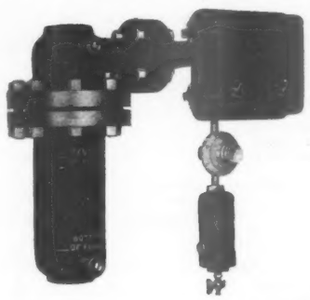
Developed primarily for accurately controlling the cooling-water temperatures of industrial engines of the gasoline or diesel types, Kontrol-Fan, Inc., Los Angeles, Calif., has announced a new-type variable-pitch fan which automatically draws more or less air through an engine radiator based upon the amount of cooling air required to maintain a predetermined temperature. Entirely automatic in its operation, the Kontrol-Fan blade assemblies function similarly to the variable-pitch propellers that are standard on all military aircraft — in that the blades feather from practically zero pitch up to as much as 38° pitch. In this manner, the air flow through the conventional radiator is varied in accordance with the amount of cooling that is required.

Cooling fans produced by the firm have been in operation for a number of years, of the variable-pitch type, but previous models have not incorporated the positive-pitch-control feature that is now a part of their newest model. A unique thermostat tube is placed between the water outlet on the cylinder head and the top of the radiator, using part of the existing hose connection. A syphon bellows expands or contracts in accordance with the temperature of the cooling water, and through a simple lever arrangement the bellows actuate the fan blade angle between the minimum and maximum pitch angles. Thus a predetermined temperature can be maintained regardless of winter or summer conditions, or the load placed upon the engine.

Economies resulting from use of the Kontrol-Fan are said to include reduced lubricating-oil consumption, reduced power absorbed by the fan during its low or partial-pitch operations, reduced crankcase sludging and engine repairs.

Fisher Announces Improved Displacement Type Level-Trol

Fisher Governor Co., Marshalltown, Iowa, announces an improved displacement-type Level-Trol that is said to feature greater sensitivity, speed of action, freedom from service-trouble, and ease of adjustment. It is available in float-cage or internal-float-type construction for handling all liquids at all pressures, temperatures, and specific gravities. Level-Trols can be used for level control, interface level control, level indica-



tion, or specific gravity control. Pilot is 100 per cent pneumatic in operation—all linkage, pivot points, and other sources of friction have been eliminated, reducing operating power to an absolute minimum. Pilot relay speeds action of diaphragm valve in response to level change in vessels, resulting in extreme sensitivity control.

Level position adjustment permits the positive controlling of level at any desired point within length of float while the throttling range adjustment makes it possible to vary the amount of level change necessary to stroke the diaphragm valve.

New design features include Inconel torque-tube construction that eliminates stuffing-box packing and lubrication. Torque tube is supported by stainless-steel knife-edge bearing that is free from gumming and sticking. Small rotary shaft turns on precision-ground ball bearing inside the pilot case.

Stainless or plated carbon-steel float is freely suspended, free from lost motion, and entirely free from friction-causing guides. Float lengths from 14 to 120 in. Fisher Level-Trols are available in five types for all service conditions.

New Germicidal Compound Substitutes for Chlorine

Bettis Sales Co., Houston, Tex., has recently introduced a germicidal compound to substitute for chlorine in the treatment of bacteria in drinking water and in sewerage systems.

The compound contains both mercury and oxide and has been developed especially to provide a bacterial agent that could be easily controlled and safely handled.

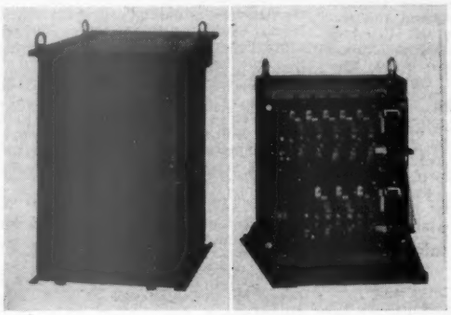
The germicide is available in liquid form in 5, 10 and 55-gal quantities.

Hunt Tool Co. Expands Houston Plant

Hunt Tool Co. has just completed a building-expansion program at its Houston, Tex., plant that included one new shop building, and new modernistic office. The new shop building houses complete facilities for reworking draw works and other heavy pieces of oilfield equipment. Engineering, accounting, and executive offices are house in the new building, which is completely air conditioned, plus other refinements.

Oil-Immersed Reduced-Voltage Starters

Reduced-voltage starters are used with a.c. squirrel-cage motors to limit the inrush starting current, or to lessen the strain on the driven machinery. The Class 431 motor starter, manufactured by Nelson Electric Manufacturing Co., Tulsa, is suitable for applications in oil refineries, gasoline plants, pumping stations, etc., where explosion-resisting motor starters are desired. By means of an auto-type transformer the starting current demand is reduced, by reducing the voltage across the motor terminal during the accelerating period. The starters are available in sizes from 5 to 500 hp., in 220, 440 and 2,200 volts.



The Class 431 oil-immersed reduced-voltage starter consists of a five-pole starting contactor, a three-pole running contactor, a control relay, a timing relay, overload protection and a two-winding auto transformer. Enclosure tank is of heavy-gage sheet steel, electrically welded. All equipment is mounted on a framework as a complete unit, easily removable from the tank. All parts of the unit are immersed under at least 6 in. of oil. An oil-level indicator mounted on the front of enclosure tank shows oil level at all times. Conduit connections are made through a conduit box mounted on the side of the enclosure tank.

Announce Multiple Fellowship On Chemical Containers

Announcement is made of the establishment of a multiple fellowship on chemical containers and storage by Pittsburgh-Des Moines Steel Co. at Mellon Institute of Industrial Research, Pittsburgh, Pa. The senior incumbent of the fellowship is Dr. James Bert Garner, a distinguished chemical engineer who is best known professionally for his achievements in hydrocarbon chemistry and technology. He is aided by Ludwig Adams, a specialist in engineering materials and welding, and by R. M. Stuchell, a research metallurgist.

The fellowship has available a large fund of scientific knowledge and chemical and physical information which is accessible to salesmen and customers. Requests for advice on the storage of any material should be made to Pittsburgh-Des Moines Steel Co.'s research department, which will arrange for the pertinent recommendation at once or after any necessary investigation.

Badger & Sons Co. Awarded Coveted Navy "E"

The Navy "E" for production achievement was awarded to E. B. Badger & Sons Co., industrial engineers, at Cambridge, Mass., on June 15 by Capt. W. D. Puleston, U.S.N. (retired), representing the secretary of the Navy.

The Navy "E" is presented to Erastus B. Badger, president, by Capt. W. D. Puleston, U.S.N. (Ret.).

Gov. Leverett Saltonstall was the principal speaker at the ceremony, and commented on the contribution of Massachusetts labor and management to the war effort. Cambridge, site of the Badger plant, and Boston, home of the Badger offices for more than 100 years, were represented by Mayors John H. Corcoran and Maurice J. Tobin.

The award was accepted on behalf of the company and its employes by Erastus B. Badger, the third member of his family to serve as president of the company.

Individual "E" lapel buttons were presented by Capt. John J. Hyland, U.S.N. (retired), inspector of naval materials, and were accepted by a committee of 17 employes, headed by John L. Allen. Subsequently buttons will be given to all employes of the company's Cambridge plant and Boston office.

AMONG EQUIPMENT MEN...

Kobe, Inc., Announces Personnel Changes

The recent appointment of H. H. Ihrig as Tulsa district manager, and John Prichard as Illinois district manager, has just been announced by Kobe, Inc.

H. H. IHRIG

JOHN PRICHARD

Mr. Ihrig, until recently district manager in charge of the company's operations in Illinois, attended both the Missouri School of Mines and the Oklahoma A. & M. school of engineering. Later he became associated with the petroleum engineering departments of Wilcox Oil & Gas Co. and Phillips Petroleum Co. In 1937 he became interested in the development of special equipment for treating emulsified crude oil and studied these problems in numerous fields throughout the Mid-Continent oil-producing states. In 1940 he joined Kobe, Inc., and has been actively engaged in the company's operations in Oklahoma, Kansas and Illinois since that time. Mr. Ihrig will make his headquarters in the company's offices at 506 Kennedy Building, Tulsa.

Mr. Prichard, before his transfer to Illinois as district manager, was district representative in charge of Kobe's activities in the Oklahoma City, Okla., area, having become associated with this company in 1940 —prior to which time, after graduating from the Oklahoma University school of petroleum engineering, he was activity engaged in various phases of the oil industry. Mr. Prichard will maintain his headquarters in the company's offices at Mount Vernon, Ill.

Taylor Named Kansas Manager Of American Iron & Machine

J. M. Taylor has been appointed district manager of Kansas, with headquarters in Great Bend, for the American Iron & Machine Works Co. Mr. Taylor replaces R. E. Craine, who was recently transferred to Houston, Tex., where he is now district manager in the Texas Gulf Coast division. Prior to his recent promotion, Mr. Taylor was sales representative in Kansas for American Iron. He has been with the company for over 7 years and is widely known in the oil industry throughout Kansas.

J. M. TAYLOR

Graver Reappointed Commissioner Of Chicago Park District

Phillip S. Graver, vice president of Graver Tank & Manufacturing Co., Chicago, Ill., has just been reappointed by Mayor Edward J. Kelly to a 5-year term as a commissioner of the Chicago Park district. At the same time he was reelected for the sixth consecutive time as vice president of the Chicago Park district. Mr. Graver has long been active in this work, having recently completed his fourteenth year of association with the South Park Board of Commissioners and the Chicago Park District Board.

PHILLIP H. GRAVER

A.G.A.E.M. President-Elect Heads Production for Maritime Commission

Col. W. F. Rockwell, president of Pittsburgh Equitable Meter Co. and Merco Nordstrom Valve Co., who is now serving as director of production for the Maritime Commission in Washington, was recently elected president of the Association of Gas Appliance and Equipment Manufacturers.

During the few months in which he has devoted his principal attention to the production problems of the intensified shipbuilding program, Colonel Rockwell has been instrumental in accelerating the output of the shipyards to a point hitherto unequalled by any country in the world. In addition to Colonel Rockwell's duties with the Maritime Commission, he also serves as a member of the executive committee, Army and Navy Muntions Board, and the War Production Board, material-requirements section.

Coons Made Manager of Sales At New Orleans for National Tube

Gerald F. Coons, formerly of National Tube Co.'s general sales department, Pittsburgh, Pa., has been appointed manager of sales of the New Orleans sales office, Canal Building, New Orleans, La., succeeding Harry L. Bialock.

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LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
20 Years Experience
Inquiries Invited
B. D. BUCKLEY
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CHEAP CRANE COUNTY Sec. 18, B28, under Magnolia-Stanolind leases. Jefferson G. Smith, 215 Littlefield Bldg., Austin, Tex.

SOUTH DAKOTA BASIN: Follow the big boys. Commercial Leases, active counties. Tracts 40 acres up. 8 to 10 years to run, ten cents per acre yearly rental. Opinions of Title furnished, $100.00 per 40. Cheap speculation with merit and possibilities. Also large drilling blocks with favorable geology. Map furnished on each sale. Inquiries solicited. Dakota Oil Exploration Company, Box 436, Pierre, S. D.

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FOR LEASE: 640 A. Cheyenne County, Colo. 160 A. Wagoner Co., Okla. NE 13-18N-19E. 600 A. Adair Co., Okla. in T 19N, R. 25E. Property stands in my name. Make offer. Spears Havely, Richmond, Va.

FOR SALE: Oil and Gas leases on proven structures, drilling propositions, small production and fluorspar deposits. Reports furnished. W. P. Harley, Bowling Green, Ky.

NEW TEXAS OIL LEASES, 5-10 acres, $3 acres, surrounding area leased, Smackover trend. 2931 Missouri, St. Louis, Mo.

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FOR SALE
OR
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4 Producing Bartlesville sand 160 acre oil leases. All connected to pipe line. Attractive for flooding.

Oil 33 to 37 Gravity

Will sell reasonable for part cash, balance in oil or join with responsible parties in flooding.

VEEDER SUPPLY & DEVELOPMENT CO.
Cherryvale, Kansas.

SEMI-I-PROVEN: Oil & Gas acreage, one well drilled thirty eight hundred feet, had heavy Gas and Oil Saturation. Hole lost. Major Co. now drilling, part. Will checkerboard for well or take override. Also 10,000 acre block 2500 ft. Both these structures south of Lance Creek, Wyo. Will furnish rig. F. B. Renfrow, Canon City, Colo.

FOR SALE: 2500 A. Oil Lease small production. Sands high Cincinnati Anticlinal 250 Ft. Corniferous an opportunity and lower sands untested. Write Bessie Wickens, Scottsville, Ky., R. F. D.

WILL sell interest thousand acres under lease, new field Penna. crude. Analysis run high cylinder content and wax distillate 45%. Inquire, F. S. Armstrong, Youngwood, Pa.

WILL drill proven acreage or drilling block of merit having good geology or seismograph. Please give enough details in first letter to warrant consideration. Write Box 1098, Shawnee, Oklahoma.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

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Working 56 hours 3 weeks per month and 44 hours one week with time and one-half for work in excess of 40 hours per week.

Must have experience in design of:

Oil Refinery Process Piping,
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and
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OIL REFINERIES
BLAST FURNACES
STEEL PLANTS
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Major oil producing company has an opening for an Automotive Superintendent. Applicant should be capable of supervising operations and maintenance of oil field automotive equipment, including diesel engines. In replying state age, education, qualifications, experience in detail and status regarding military service to Box B-161, The Oil and Gas Journal, Tulsa, Okla.

ENGINEERS WANTED
Chemical or Mechanical with minimum one year oil refinery plant operation or maintenance experience. Require University Engineering School graduate with basic knowledge principles fluid flow. To work on process flow sheets, equipment selection and general handling oil refinery. Defense Contracts as assistant to senior engineers. No aliens or men engaged Defense work considered. Opportunity up to individual. In reply state experience, education, draft status, salary expected. Foster Wheeler Corporation, Room 2402, 165 Broadway, New York.

REFINERY ENGINEERS
Excellent opportunities for several capable oil refinery engineers, with old established engineering concern. Should have technical education, with a thorough knowledge of refinery equipment and processes. Salary commensurate with experience and capabilities.

Application should be made by letter, giving age, nationality, outline of previous business experience and educational background, present salary, salary desired, and references. Include recent photograph. Ernest Owen, E. B. BADGER & SONS COMPANY, 75 Pitts St., Boston, Mass.

Situations Wanted

POSITION wanted by man having 25 years experience constructing and maintaining pipe lines. Can handle anything in erecting or repairing steel tanks. Experience in protecting steel tanks from air raids or shell fire. Can go anywhere. Box B-130, The Oil and Gas Journal, Tulsa, Okla.

REFINERY Technician and Process Supervisor. M.I.T. graduate. 17 years' varied experience. Includes oil, waxes, asphalts, specialties, Chief Chemist, Process development, plant superintendent, management experience. Age 36. Draft status, 3-A. Box B-141, The Oil and Gas Journal, Tulsa, Okla.

MALE SECRETARY — BBA Degree. Draft Deferred. Gregg Shorthand and Excellent Typist. Experience Oil Leasing. Now employed but desires job as Junior Executive with Future. Box B-160, The Oil and Gas Journal, Tulsa, Okla.

Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

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WANTED
Large Steel Storage Tanks and Structural Steel Buildings.
GREENSPON'S
National Stock Yards
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WANTED
2—35,000-55,000 bbl. storage tanks.
2—1300' air compressors.
20—25 ton locomotive cranes.
R. C. STANHOPE, INC.
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WANTED—BULK PETROLEUM STORAGE, 10,000 BBLS. TANKS OR LARGER. Box B-120, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Small lubricating plant to dismantle and move. Box B-150, The Oil and Gas Journal, Tulsa, Okla.

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What will they be worth then—only Scrap price?

Consider, then, their abnormal worth today?

You may realize TODAY—

Mileage returns of next several years! Present book carriage! Appreciable profit *additionally*!

Ordinarily, anyone of these three features is considered satisfactory realization!

You would, also, amortize NOW Replacement later with new and modern cars from the avoidance and saving of present excessive maintenance costs, the profit and accumulated interim interest, etc., etc.!

Obtain our quotation without obligation.

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37 years' experience
13412 S. Brainard Ave., Chicago, Ill.
***"ANYTHING* containing IRON or STEEL"**

WANTED: Used Water Pumps for Flooding. Want several 3½" by 8" Triplex Worthingtons capable of 800# discharge pressures or similar pumps. State location, price, and details of condition. P. O. Box 2249, Wichita Falls, Texas.

WILL PAY CASH
Storage tanks, abandoned pipe lines or wells, gasoline plants, refineries or any material accumulating from the oil fields regardless of location. WILL HANDLE UNLIMITED DEALS.
PLANT and EQUIPMENT PURCHASING CORP.
705 Provident Bank Bldg., Cincinnati, Ohio

WANTED
Bignall and Keeler 4" to 12" Pipe Threading Machine. State condition, price, number and thread sizes of dies and full details. Valley Steel Products Company, St. Louis, Mo.

For Sale—Equipment

FOR SALE: 1 Brauer Steam operated shale shaker, $100. Patridge, Cities Service Oil Co., Bartlesville, Okla.

#81 KEYSTONE Spudder, 65. ft. mast, all steel, Caterpillar mount complete with 4" to 10" tools. Utility & Industrial Supply Company, Jackson, Michigan.

FOR SALE 38 x 7, 40 x 8, and 10.50 x 24 used tires and tubes. Patridge, Cities Service Oil Co., Bartlesville, Okla.

50,000 FT. 2" Line Pipe, Screw & P. E. Also 3", 4", 6", 8" and other sizes. Large stock of fittings, valves & other material. GILBERT PIPE & SUPPLY, Electra, Tex.

FOR SALE—One 96 foot rotary drilling derrick now standing near Seminole, Oklahoma. Good condition, price $600.00. Inquire Eason Oil Co., Enid, Okla.

FOR SALE: Oil Hill, Kansas 3 Sullivan Improved N Hydraulics only $100.00 ea. 6—3" x 4" GD chain driven power pumps. $50.00 ea. 4—2" Viking Pumps $10.00 ea. 1—CN Sullivan Drill, $250.00. 1—Sullivan 20 drill only $250.00. 5—GD Power Pumps robbed, $50.00 ea. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: 7⅛ x 14 Oil Well Power Slush Pump. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: One #10 Adams Leaning Wheel Grader, located at Russell, Kansas. Patridge, Cities Service Oil Co., Bartlesville, Okla.

3—150-HP 150# Working Pressure horizontal Return Tubular Boilers with breeching, in good condition; also unusually good stock of three, four and six inch valves and fittings for refinery and pipe line service. Call or write Eason Oil Co., Enid, Okla.

SOUTHWESTERN Engineering Distillation Unit, 5000 Gal. Cap.; Wt. 34,000 lbs. Complete with condensers, heat exchangers, etc. Perfect condition. Original price, $16,000. Take 25%. See it at
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FOR SALE: At Oklahoma City six #1 Smith 4' 6" x 16' Standard Oil and Gas Separators. Patridge, Cities Service Oil Co., Bartlesville, Oklahoma.

USED CASING FOR SALE
5,000' 2" 4½# Tubing & Rods
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Five wells producing about twelve barrels per day, each equipped with standard rig, gas engine, 2,500' tubing and approximately 4,000' casing.
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35 H.P. Superior Gas Engine and 16 foot Band Wheel Power. Condition A-1. The Geo. McGinley Supply Co., Bowling Green, Kentucky.

FOR SALE — OIL STORAGE TANKS
6—31,000 bbl. with breather roofs.
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In first class condition — ready for immediate delivery.
1—Parkersburg SC-11 Pumping Unit, Stroke 5' to 11'.
JOS. GREENSPON'S SON PIPE CORP.
National Stock Yards (St. Clair County), Illinois.

FOR SALE: Wilson-Mogul Drawworks with water cooled brakes and 100 H.P. International Motor. Melton Supply Co., Seminole, Oklahoma.

FOR SALE at Wewoka: 1-10 ton Athey Trusswheel wagon, Model 843, Serial J616. $150. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: 14" Groove V Belt Pulley.
525 Waggoner Building
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FOR SALE: Four 125-HP, 250# working pressure boilers, Oilfield type; also one 7" R. B. Union Tool unitized draw works, good condition, almost same as new. Inquire. T. T. Eason & Company, Enid, Okla.

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3000—2" (11½-thd.) x 3½" Long Upset Tubing Couplings 10c each.
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ALL OR ANY PART—COMPLETE 2000 BARREL REFINERY

Bubble Tower 5'x52'x⅜" — 21 Trays With Caps Chrome Alloy — 2000 bbl. Pipe Still, 2½" ID x 2 15/16" OD x 20' Tubes Alloy Headers — 8 Heat Exchangers, 255 sq. ft. ea. All New Tubes — Complete Copper Sweetening Unit — New Carload Ethyl Plant — 47 Storage Tanks from 500 to 15000 bbl. cap. — 30 Pumps All Types — Valves — Fittings — Pipe

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OIL TRANSPORTS

4 — Diamond T tractors, 10 wheels, good tires. Capacity 77 bbls. each.

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FOR SALE: 27½" Ideal Rotary Table, 5 sheave 200 ton Crown Block, 4 sheave 72" traveling block, 8" Ideal enclosed rotary hook. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE

3—125 HP 350 WP Acme Boilers
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12000 Ft. 4" API Full Hole Drill Pipe
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Major Tool & Supply Co., Okla. City, Okla.

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Four Caterpillar gasoline motors, new, 75 H.P. complete with governors, master clutch, carburetor, and magneto, not mounted, suitable for power unit; $395.00 each. O. C. Evans, Mt. Sterling, Ky.

FOR SALE: At Oklahoma City, 65, 70, 75 and 85 HP Oil Field Type Boilers, repaired, tested and ready to go. Also large stock of unrepaired boilers. Patridge, Cities Service Oil Company, Bartlesville, Okla.

FOR SALE — 24,000' of ⅝" and 3000' of ¾" Pump Rods. One 87' MIW 157,000 lb. Derrick. One TC20B Oil Well Pump Unit, and misc. pumping equipment. All in first class condition. Dirks Brothers, Tuleta, Bee County, Texas.

FOR SALE: 12 K.W. Portable Light Plant powered by 35 H.P. International Engine. Melton Supply Co., Seminole, Okla.

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7' x 30' STEEL Riveted Horizontal Storage Tanks. Also towers, vessels, etc. GILBERT PIPE & SUPPLY, Electra, Tex

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Large selection—All sizes and types. Generator units, marine engines, gasoline engines, auxiliaries—boilers, steam engines, and turbo-generator sets.

Complete information on request.

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FOR SALE: 1 Askenia Type Magnetometer #7970, $750.00. Cities Service Oil Co., Bartlesville, Okla.—H. D. Patridge.

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COMPRESSORS

Complete Repressuring or Air Lift Plant for Immediate Delivery.

2—13 & 5½ x 12 Ingersoll-Rand XOB compressors 400# pressure V-belt driven by 120 H.P. Chicago Pneumatic 3-cylinder vertical gas engines.

2—12 & 7 x 10 Chicago Pneumatic 400# pressure vertical compressors direct connected to 120 H.P. 3-cylinder Chicago Pneumatic vertical gas engines complete.

Used very little — excellent condition. Located on original foundation in Louisiana.

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TANKS:
5—23000 Gallons Horizontal ⅜" Steel, Riveted
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8— 8000 Gallons Vertical ⅛" Steel, Welded
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COMPOUNDING KETTLES:
2—1200 Gallons Vertical with mixers, riveted, ½" steel
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STEAM JACKETED KETTLES, Open Top, R Riveted, W Welded. Capacities Gallons—154 R—350 R—350 W—450 R—500 W—1000 R—2400 R.

VIKING OIL PUMPS:
1—2" Quadruple Pump with 10 HP AC Motor, Capacity each pump 90 GPM.
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BRAND NEW WESTFALIA OIL PURIFIERS & BENZINE CLARIFIERS. Capacities 75-165-700-1500 GPH.

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75—4" Cast Iron Flanged Tees Fig. 91 —125 lbs. Crane, Stockham, Walworth makes.
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OIL STORAGE TANKS

IN GOOD CONDITION

2—80,000 Bbl.
1—35,000 Bbl.
1—5,000 Bbl.
1—4,400 Bbl.
3—2,500 Bbl.
1—3,000 Bbl.
1—1,000 Bbl.
1— 600 Bbl.
1— 100 Bbl.
2—1,200 Bbl. Agitators (prac. new)

Address Your Inquiries to

Dulien Steel Prod., Inc.
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FOR SALE: 6 x 16 Wilson-Snyder Power Slush Pump. Melton Supply Co., Seminole, Okla.

FOR SALE: Two Speed Increasers, 294 Horsepower, A. G. M. A., No. 1 rating, 125 to 150 Horsepower Service Rating, 1 to 4 Ratio. Telephone 4-6019, Tulsa, Okla.

Steel VALVES!

Cast and Forged Cast Iron Valves

Standard and High Pressure

Every Type Used in an Oil Refinery

All Expertly Reconditioned and GUARANTEED to Perform Like New.

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YOU SAVE 25%

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For 8 years, a division of our plant has specialized in reconditioning valves for major oil companies and large industrial plants. Our shops are equipped with the most modern and efficient tools and facilities for rebuilding valves. Every valve has been expertly reground, reseated, repacked and hydrostatically tested. GUARANTEED to give same service as new valves.

DON'T DELAY. Order your valve requirements NOW and save 25% and more! We can also make immediate shipment of reconditioned flanges—ells—tees—and other fittings at savings of from 25% to 40%. Order TODAY.

Brown-Strauss Corporation
1446 Guinotte . . . Kansas City, Mo.

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FOR SALE: Double Drum Drilling-in and Clean-out unit with Spudding attachment, capable to 5500 feet. A-1 condition, with 55 foot sectional sheave roller-bearing mast. Price $3000. For quick sale. Terms. Box 133, McPherson, Kansas.

EMCO-McGAUGHY Integrator for Foxboro and Emco Recording Orifice Meter Charts, good condition. Utility & Industrial Supply Co., Jackson, Michigan.

FOR SALE: Star Mfg. Company, portable cooling tower, telescoping type, 7' wide, 13' long, 8' high. All steel. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE — ONE 27,500 BARREL BOLTED FUEL OIL STORAGE TANK IN GOOD CONDITION, $9,000 ON CAR F.O.B. Address your inquiries to: Arrow Petroleum Co., 7419 Franklin Street, Forest Park, Ill., c/o A. C. Bartsch.

FOR SALE: At Oil Hill, Kansas, 2 McCormick-Dearing steel wheel well servicing tractors with Bearcat front end winches, $200.00 each. Patridge, Cities Service Oil Company, Bartlesville, Oklahoma.

FOR SALE—Casinghead Gasoline Plant —Old Style, Absorption Type. Throughput Capacity—10,000 MCF. Good Condition and Complete. Shut down June 1, 1942. Location—Bristow, Oklahoma. Oklahoma Utilities Company, Ft. Worth, Tex.

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25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x8 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio

FOR SALE

1—300 h.p. filler improved gas engine, 4 cylinder, horizontal type, 4 cycle, 17½" bore, 24" stroke, 185 rpm.
1—85 h.p. Bessemer gas engine, 2 cylinder, horizontal type, 180 rpm.
Located at Iola, Kansas, and offered for immediate shipment. The William W. Newell Company, Box 477, Nashville, Tennessee.

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The Philtower
Tulsa, Oklahoma

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa, Okla.

FOR SALE—Landowner's Royalty under 160 acres leased to Humble Oil & Ref. Co. in Lea County, N. M., 27 pools in the county. Will sell in small interests. HARRY S. WRIGHT, FARMINGTON, NEW MEXICO.

INQUIRIES invited to buy or sell producing royalties, Illinois preferable. J. A. Wolf, 407 S. Dearborn St., Chicago, Ill.

Ranches and Farm Lands

NEW MEXICO RANCH

10,800 acres solid body, located near Las Vegas, elevation 7,000 ft. Watered by wells and running water. 1100 acres under irrigation, growing alfalfa, other forage and grain crops. Now carrying about 600 cattle. Owned by Easterners. For details: E. N. REQUA REALTY CO., BRADY BLDG., SAN ANTONIO, TEX.

Incorporation

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

Financing

CAPITAL SEEKERS — Interested in raising $25,000 or more for a legitimate project should communicate with AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

OUT OF 5000 American financial houses only 223 bought small issues last few years. The 223 names $4.00. JOHN F. MORRIS, Box 5411, Philadelphia.

Business Opportunities

NEW Rotary Combustion Motor possibly 125 miles per gal. gas with compressed oxygen very simple arranged, keeps air plans perfectly balanced. Costs less than $1500 to build.

20,000 A. Ariz. leases oil at 1900, 2300, 3400, 4880. Owner has 2 to 4+% Tungsten mine; investigate. H. Freels, 251 S. Hill St., Los Angeles, Calif.

Journalisms:

WHILE the East Coast labors under a scarcity of gasoline and other petroleum products, men in the field are scratching their more or less noble brows on what to do with an excess of butane. This is a valuable material, the production of which has been increasing steadily, but the tightening of the transportation of such commodities has left some companies with an excess which must go to storage. In normal times it would be a tough problem in economics to determine the feasibility of building tanks for the purpose.

The foregoing observations add impetus to an idea which has been kicking around in the minds of many production men for a number of years—the storage of finished products in subsurface reservoirs. This idea has been successfully applied to gas, and now it remains to do the same with butane, gasoline, etc. Experimental projects are under way.

Putting the butane into the formation is a simple matter, but getting it out again, and how much can be recovered is a different question. Some of the answers are provided in an article scheduled for early publication. The title of the piece is "Recovery of Gasoline Stored in Laboratory Crude-Oil Reservoirs," by Harold Vance and Paschal Martin, of A. & M. College of Texas.

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A FEW months ago we told in this column of a request from Harvard University to use some of the material in the Journal in connection with classroom work. Now comes a request from the opposite extreme of the continent for similar permission. The University of California wants to reproduce a flow diagram that appeared in a recent issue as a lantern slide and roto print, to exhibit to students in petroleum engineering at that institution. Permission is gladly granted. What better way is there to start young engineers off to good reading habits than in the formative years of their training?

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DISCUSSION is beginning to break out in print as to where to place the forty-ninth star in Old Glory, if and when Hawaii is admitted into the Union as the forty-ninth state. This problem will doubtless be solved, just as it has each time the necessity has arisen to rearrange the stars due to a newcomer in the Union. What is of more immediate concern to Americans today, is the growing number of stars on service flags throughout the land. Oil companies have reason to be proud of the many stars their service flags are showing. Note: See the Personal Paragraphs page any week in the Journal, and note how many oil-company employes are responding to the call to war duty.

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NO sooner does one special issue of the Journal roll off the press, than the editors are knee deep in preparation for the next one. The next "fat" issue you will receive will be the semiannual statistical number. In this issue, as well as in its companion issue which comes out late in January, the editors assume a Janus stance, and attempt to look backward and forward at the same time. The looking back part is easy, for resort can be had to plain and fancy figures, and the only difficult task is that of interpreting. But it's a brave editor who will hazard a look ahead in these parlous times, and attempt to prognosticate what the future holds. But we are committed to just that.

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THIS week, on Page 27, is the first of two installments on "Calculation of Load and Stroke in Oil-Well Pump Rods," by B. F. Langer and E. H. Lamberger, of Westinghouse Electric & Manufacturing Co.

This material is of particular importance now as it points the way to a more efficient use of sucker rods for lifting oil needed to axe the Axis. Application of the formulas developed through research conducted by Westinghouse, Phillips Petroleum Co. and Sargent Engineering Co. will permit rods containing very little of the scarce elements in steel alloys to be used successfully.

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EVERY so often, just to keep from getting punch drunk on oil reading, we stray over into other fields just to see how the other half conducts its affairs. Currently, there is much discussion in the trade press of certain other industries on adopting "around the clock" operations. Increased war needs can't wait on additional construction, even if materials for the construction were available, therefore, production must be bumped up with existing facilities. It seems that 24-hour schedules entail considerable thought and planning. There must be heat, steam, water, lockers, and locker-room facilities, proper supervision at night, meals, and so on down the list. All this is old stuff to the oil industry. Most of its operations have been on a 24-hour-a-day schedule since the industry was a pup.

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CALENDAR

September

NATIONAL PETROLEUM ASSOCIATION, annual meeting, Hotel Traymore, Atlantic City, N. J., September 16-18.

October

NATIONAL SAFETY CONGRESS AND EXPOSITION, Stevens Hotel, Chicago, October 5-9.

TEXAS MID-CONTINENT OIL AND GAS ASSOCIATION, twenty-third annual meeting, Dallas, Tex., October 8-10.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, fall meeting, Rochester, N. Y., October 12-14.

INDIANA INDEPENDENT PETROLEUM ASSOCIATION, fall meeting, Hotel Severin, Indianapolis, Ind., October 14-15.

NATIONAL STRIPPER WELL ASSOCIATION, annual meeting, Wichita, Kans., October 19.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, thirteenth annual convention, Wichita, Kans., October 20-22.

NATIONAL LUBRICATING GREASE INSTITUTE, tenth annual meeting, New Orleans, La., October 25-29.

ILLINOIS MINERAL INDUSTRIES CONFERENCE, Campus, University of Illinois, Urbana, Ill., October 30-31.

November

AMERICAN PETROLEUM INSTITUTE, twenty third annual meeting, Stevens Hotel, Chicago, Ill., November 9-13.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, thirty-fifth annual meeting, Netherlands Plaza Hotel, Cincinnati, Ohio, November 16-18.

AMERICAN CHEMICAL SOCIETY, national chemical exposition and national industrial chemical conference, Stevens Hotel, Chicago, Ill., November 17-21.

December

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, annual meeting, New York, November 30-December 4.

PETROLEUM ACCOUNTANTS SOCIETY OF OKLAHOMA, Hotel Mayo, Tulsa, December 17.